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Report of the Scientific and Technical Subcommittee on its fifty-second session, held in Vienna from 2 to 13 February 2015

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I. Introduction

1. The Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space held its fifty-second session at the United Nations Office at Vienna from 2 to 13 February 2015, under the chairmanship of Elöd Both (Hungary).

2. The Subcommittee held 20 meetings.

A. Attendance

3. Representatives of the following 61 States members of the Committee attended the session: Algeria, Argentina, Armenia, Australia, Austria, Belarus, Belgium, Bolivia (Plurinational State of), Brazil, Bulgaria, Burkina Faso, Canada, Chile, China, Colombia, Costa Rica, Cuba, Czech Republic, Ecuador, Egypt, France, Germany, Greece, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Japan, Jordan, Kenya, Lebanon, Luxembourg, Malaysia, Mexico, Mongolia, Netherlands, Nicaragua, Nigeria, Pakistan, Peru, Philippines, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Saudi Arabia, Slovakia, South Africa, Spain, Sweden, Switzerland, Tunisia, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America, Venezuela (Bolivarian Republic of) and Viet Nam.

4. At its 815th meeting, on 2 February, and at its 828th meeting, on 10 February, the Subcommittee decided to invite, at their request, observers for the Dominican Republic, El Salvador, Israel, Oman, Panama, Sri Lanka and the United Arab Emirates to attend the session and to address it, as appropriate, on the understanding that it would be without prejudice to further requests of that nature and that doing so would not involve any decision of the Committee concerning status.

5. At its 815th meeting, on 2 February, the Subcommittee decided to invite, at its request, the observer for the European Union to attend the session and to address it, as appropriate, on the understanding that it would be without prejudice to further requests of that nature and that doing so would not involve any decision of the Committee concerning status.

6. At its 817th meeting, on 3 February, the Subcommittee decided to invite, at its request, the observer for the Sovereign Military Order of Malta to attend the session and to address it, as appropriate, on the understanding that it would be without prejudice to further requests of that nature and that doing so would not involve any decision of the Committee concerning status.

7. Observers for the Office for Disarmament Affairs of the Secretariat, the International Civil Aviation Organization (ICAO), the International Telecommunication Union (ITU) and the World Meteorological Organization (WMO) attended the session.

8. The session was attended by observers for the following intergovernmental organizations with permanent observer status with the Committee: Asia-Pacific Space Cooperation Organization (APSCO), European Organisation for Astronomical Research in the Southern Hemisphere (ESO), European Space Agency (ESA), European Telecommunications Satellite Organization (EUTELSAT-IGO),

Inter-Islamic Network on Space Sciences and Technology (ISNET) and International Mobile Satellite Organization (IMSO).

9. The session was also attended by observers for the following non-governmental organizations having permanent observer status with the Committee: African Association of Remote Sensing of the Environment (AARSE), Committee on Space Research (COSPAR), EURISY, European Space Policy Institute (ESPI), International Academy of Astronautics (IAA), International Association for the Advancement of Space Safety (IAASS), International Astronautical Federation (IAF), International Astronomical Union (IAU), International Society for Photogrammetry and Remote Sensing (ISPRS), International Space University (ISU), Prince Sultan bin Abdulaziz International Prize for Water (PSIPW), Scientific Committee on Solar-Terrestrial Physics (SCOSTEP), Secure World Foundation (SWF), Space Generation Advisory Council (SGAC) and World Space Week Association (WSWA).

10. At its 815th meeting, on 2 February, the Subcommittee decided to invite, at its request, the observer for the European Science Foundation to attend the session and to address it, as appropriate, on the understanding that it would be without prejudice to further requests of that nature and that doing so would not involve any decision of the Committee concerning status.

11. The Subcommittee took note of the applications of El Salvador, Qatar and Sri Lanka for membership in the Committee (A/AC.105/C.1/2015/CRP.14, A/AC.105/C.1/2015/CRP.4 and A/AC.105/C.1/2015/CRP.34, respectively).

12. A list of the representatives of States, United Nations entities and other international organizations attending the session is contained in A/AC.105/C.1/2015/INF/44 and Corr.1.

B. Adoption of the agenda

13. At its 815th meeting, on 2 February, the Subcommittee adopted the following agenda:

1. Adoption of the agenda.
2. Statement by the Chair.
3. General exchange of views and introduction of reports submitted on national activities.
4. United Nations Programme on Space Applications.
5. Space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda.
6. Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment.
7. Space debris.
8. Space-system-based disaster management support.

9. Recent developments in global navigation satellite systems.

10. Space weather.

11. Near-Earth objects.

12. Use of nuclear power sources in outer space.

13. Long-term sustainability of outer space activities.

14. Examination of the physical nature and technical attributes of the geostationary orbit and its utilization and applications, including in the field of space communications, as well as other questions relating to developments in space communications, taking particular account of the needs and interests of developing countries, without prejudice to the role of the International Telecommunication Union.

15. Draft provisional agenda for the fifty-third session of the Scientific and Technical Subcommittee.

16. Report to the Committee on the Peaceful Uses of Outer Space.

C. General statements

14. Statements were made by representatives of the following member States during the general exchange of views: Algeria, Argentina, Austria, Brazil, Burkina Faso, Canada, Chile, China, Cuba, Czech Republic, France, Germany, Hungary, Italy, India, Indonesia, Iran (Islamic Republic of), Japan, Luxembourg, Malaysia, Mexico, Nigeria, Pakistan, Poland, Republic of Korea, Romania, Russian Federation, South Africa, Switzerland, Ukraine, United States, Venezuela (Bolivarian Republic of) and Viet Nam. A statement was made by the observer for Panama on behalf of the Group of Latin American and Caribbean States. A statement was also made by the observer for El Salvador. General statements were also made by the observers for APSCO, ESA, IAA, IAF, ISNET, SGAC and SWF.

15. The Subcommittee heard the following scientific and technical presentations:

(a) "Recent Indian space missions: update as of February 2015" and "India's Mars Orbiter Mission in Mars orbit", by the representatives of India;

(b) "The new progress of the lunar project in China", by the representative of China;

(c) "Biological investigations onboard the Bion-M No. 1 and Foton-M No. 4 spacecraft" and "Search for dark matter particles in space: international PAMELA and GAMMA-400 experiments", by the representatives of the Russian Federation;

(d) "Visual infrared spectrometers: the Italian search for the origin of the solar system", by the representative of Italy;

(e) "Rosetta-Rosina: a glimpse of a very ancient world", by the representative of Switzerland;

(f) "Possible uses of nanosatellites for various mission applications", by the representative of Hungary;

(g) "ESA human spaceflight today: the ISS", by the observer for ESA;

(h) "World Space Week 2015", by the observer for WSWA;

(i) "ICAO/OOSA Aerospace Symposium", by the observer for ICAO;

(j) "The Space Generation Congress 2014: perspectives from university students and young professionals in the space sector", by the observer for SGAC.

16. The Subcommittee welcomed Luxembourg as a new member of the Committee on the Peaceful Uses of Outer Space.

17. At the 815th meeting, the Chair of the Subcommittee made a statement outlining the work of the Subcommittee at its current session. He brought to the attention of the Subcommittee several provisions of General Assembly resolution 69/85 pertaining to the current work of the Subcommittee. The Chair in his statement emphasized that in building upon the contribution of the Committee on the Peaceful Uses of Outer Space to the United Nations Conference on Sustainable Development (A/AC.105/993), the establishment and strengthening of sustainable and standards-driven spatial data infrastructures merited recognition as a means of implementing development goals and objectives within the context of the post-2015 development agenda process.

18. Also at the 815th meeting, the Director of the Office for Outer Space Affairs of the Secretariat made a statement in which she reviewed the work carried out by the Office during the previous year and presented a detailed description of planned activities for the coming year, including outreach activities and cooperation and coordination with United Nations entities and international intergovernmental and non-governmental organizations. She also highlighted the current financial status of the Office and stressed the importance of the availability of adequate financial and human resources for the successful implementation of the programme of work of the Office. In that regard, it was essential that the Office be provided with the level of resources necessary for the fulfilment of the full scope of its mandate. She explained that, as the global community was shaping new sustainable development goals and formulating the global development agenda in the post-2015 context, it was important to mobilize support and commitment at the global level to increase the role of space-based technology and information as an enabler for reaching the goals and objectives of the post-2015 development agenda.

19. The Subcommittee noted the important anniversaries in 2015, such as the fiftieth anniversary of the first spacewalk performed by a human, Soviet cosmonaut Alexey A. Leonov (the Russian Federation); the fortieth anniversary of the Apollo-Soyuz Test Project; the fifteenth anniversary of continuous human habitation of the International Space Station; and the twenty-fifth year in space of the Hubble Space Telescope.

20. The view was expressed that the continuous enlargement of the Committee in the past few years demonstrated the confidence that the international community attached to the multilateral system.

21. Some delegations reaffirmed the commitment of their countries to the peaceful use and exploration of outer space and emphasized the following principles: equal and non-discriminatory access to outer space and equal conditions for all States, irrespective of their level of scientific, technical and economic development;

non-appropriation of outer space, including the Moon and other celestial bodies, by claim of sovereignty, use, occupation or any other means; the non-militarization of outer space, the non-placement of weapons in outer space, and its strict use for the improvement of living conditions and peace on the planet; and regional cooperation to promote the development of space activities.

22. Some delegations expressed the view that, given the impact of space activities on human life and the environment, there should be greater coordination and interaction between the Scientific and Technical Subcommittee and the Legal Subcommittee in order to promote the establishment of binding international norms addressing issues such as space debris and the use of nuclear power sources in outer space, which were critical issues in the use and exploration of outer space.

23. Some delegations expressed the view that developing countries should benefit from space technologies, in particular to support their social and economic development; that it was necessary to promote cooperation to facilitate data exchange and the transfer of technology among States; and that training of scientists in developing countries was crucial for the free flow of scientific information and data exchange, increased capacity-building and the sharing of knowledge.

24. Some delegations expressed the view that any initiative related to the use of outer space should be addressed by the Committee and that the discussion within multilateral organizations with specific mandates was an essential condition for the development of binding legal instruments that contributed to the improvement of space law and that would allow the equal participation of all States. Those delegations were of the view that in relation to outer space, issues of disarmament, international cooperation and space debris could not be subject to non-binding agreements negotiated outside the framework of the United Nations.

25. The view was expressed that the Subcommittee provided a unique platform at the global level for international cooperation in space research and long-term space utilization and that its role for the next half century would be significant. In that regard, the delegation expressing that view was also of the view that one of the Subcommittee's areas of focus should be the contribution of space-based technology to sustainable development.

26. The Subcommittee expressed its gratitude to the organizers of the following events held on the margins of the current session of the Subcommittee:

(a) Presentation and display at the permanent space exhibit of the Office for Outer Space Affairs of the Argentine ARSAT-1 telecommunications satellite and Tronador II space vehicle models, by Argentina;

(b) The "Space for global health" event, by ESPI and the Office for Outer Space Affairs;

(c) Presentation of a model of the Mars Orbiter Mission, donated for the permanent space exhibit of the Office for Outer Space Affairs, by India;

(d) Press conference on the joint United States-Russian one-year mission to the International Space Station, by Julie Robinson, Chief Scientist for the International Space Station of the National Aeronautics and Space Administration (NASA) at the Johnson Space Center of the United States, and Simonetta Di Pippo, Director of the Office for Outer Space Affairs;

(e) Presentation of the ESA Rosetta mission, entitled "Rosetta's journey: unlocking the origins of life", by ESA;

(f) Seminar on space and sustainable development, entitled "Role of space-based applications in disaster risk reduction in the context of the Third World Conference on Disaster Risk Reduction", by Japan;

(g) Interactive exhibition on the European satellite navigation systems (European Geostationary Navigation Overlay Service (EGNOS) and Galileo), by the European Commission and the European GNSS Agency.

D. National reports

27. The Subcommittee took note with appreciation of the reports submitted by Member States (A/AC.105/1077 and Add.1 and 2, A/AC.105/C.1/2015/CRP.17 and A/AC.105/C.1/2015/CRP.18) for its consideration under agenda item 3, "General exchange of views and introduction of reports submitted on national activities". The Subcommittee recommended that the Secretariat continue to invite Member States to submit annual reports on their space activities.

E. Symposium

28. On 2 February, COSPAR organized a symposium on the theme "Measuring the universe: looking back in time with modern astronomy", which was moderated by Karl-Heinz Glassmeier of COSPAR.

29. The presentations given at the symposium included the following: "Measuring the universe" by Karl-Heinz Glassmeier of the COSPAR Bureau and the Technical University of Braunschweig, Germany; "The Gaia mission" by Timo Prusti of the ESA Scientific Support Office, European Space Research and Technology Centre, Noordwijk, the Netherlands; "Gaia, the galaxy in one petabyte" by Carme Jordi of the Institute of Cosmos Sciences, University of Barcelona, Spain; "Space science satellites in Brazil 2014" by Francisco Jablonski, the National Institute for Space Research (INPE) of the Ministry of Science, Technology and Innovation, São José dos Campos, Brazil; "GalileoMobile: bringing astronomy to rural areas" by Maria Dasi Espuig and Mayte Vasquez, of the GalileoMobile project, Imperial College London, United Kingdom and the German Aerospace Centre Oberpfaffenhofen, Munich, Germany; and "Gaia and the epistemology of astrophysics" by Sibylle Anderl, Université Joseph Fourier, Grenoble, France.

F. Adoption of the report of the Scientific and Technical Subcommittee

30. After considering the items before it, the Subcommittee, at its 834th meeting, on 13 February 2015, adopted its report to the Committee on the Peaceful Uses of Outer Space, containing its views and recommendations, as set out in the paragraphs below.

II. United Nations Programme on Space Applications

31. In accordance with General Assembly resolution 69/85, the Subcommittee considered agenda item 4, "United Nations Programme on Space Applications".

32. At the 826th meeting, the Expert on Space Applications made a statement outlining the activities carried out and planned under the United Nations Programme on Space Applications.

33. The representatives of Canada, China, Colombia, Cuba, Germany, Japan, Republic of Korea, Saudi Arabia, the United States and Venezuela (Bolivarian Republic of) made statements under agenda item 4. A statement was also made under the item by the representative of Chile on behalf of the Group of Latin American and Caribbean States. During the general exchange of views, statements relating to the item were also made by observers for APSCO.

34. The Subcommittee heard the following scientific and technical presentations:

(a) "BRITE Constellation: two years in orbit", by representatives of Austria;

(b) "SpaceTech: a postgraduate master's degree programme in space systems and business engineering of the Graz University of Technology", by the representative of Austria;

(c) "Report of the new RCSSTEAP (China)", by the representative of China;

(d) "DropTES: a United Nations-Human Space Technology Initiative fellowship programme — report on the first cycle", by representatives of Germany;

(e) "Introduction of UNISEC-Global", by the representative of Japan;

(f) "United Nations/Mexico Symposium on Basic Space Technology: making space technology accessible and affordable — a Mexican experience", by the representative of Mexico.

A. Activities of the United Nations Programme on Space Applications

35. The Subcommittee had before it the report of the Expert on Space Applications, outlining the mandate and orientation of the United Nations Programme on Space Applications (see A/AC.105/1085, paras. 2-11). The Subcommittee noted that the Programme for 2014 had been carried out satisfactorily and commended the work accomplished by the Office under the Programme.

36. The Subcommittee noted with appreciation the voluntary contributions, cash and in-kind, provided by various Member States and organizations for 2014 (see A/AC.105/1085, para. 53).

37. The Subcommittee noted that the priority areas of the Programme were environmental monitoring, natural resource management, satellite communications for tele-education and telemedicine applications, disaster risk reduction, the use of global navigation satellite systems, the Basic Space Science Initiative, space law, climate change, the Basic Space Technology Initiative and the Human Space Technology Initiative.

38. The Subcommittee noted, that in 2015 the new thematic priority of monitoring and protecting biodiversity and ecosystems would be included in the Programme.

39. The Subcommittee noted that the Director of the Office for Outer Space Affairs and the Expert on Space Applications had informed it of the status of resources, including the impact of the reduction in the Office's human resources on the Programme. The Subcommittee noted that additional human resources were necessary to fully implement the range of activities to be conducted by the Programme and that without such an increase the Office would not be in a position to meet the increasing demands by Member States with respect to the sustainable development goals and the post-2015 development agenda.

40. Some delegations expressed concern that the Office's resources, in particular its human resources, were inadequate for the Office to continue implementing the full breadth of its mandate.

1. Year 2014

Meetings, seminars, symposiums, training courses and workshops

41. The Subcommittee had recommended the approval of the following programme of meetings, symposiums and workshops for 2014:

(a) United Nations Expert Meeting on the International Space Station Benefits for Health, held in Vienna on 19 and 20 February;

(b) United Nations/Morocco Third International Conference on the Use of Space Technology for Water Management, jointly organized with PSIPW, held in Rabat from 1 to 4 April;

(c) United Nations/Austria Symposium on Space Science and the United Nations, held in Graz, Austria, from 22 to 24 September;

(d) United Nations/International Astronautical Federation Workshop on Space Technology for Socioeconomic Benefits, held in Toronto, Canada, from 26 to 28 September;

(e) United Nations/Mexico Symposium on Basic Space Technology, held in Ensenada, Mexico, from 20 to 23 October;

(f) United Nations/China/Asia-Pacific Space Cooperation Organization Workshop on Space Law, held in Beijing from 17 to 20 November;

(g) United Nations/Abdus Salam International Centre for Theoretical Physics Workshop on the Use of Global Navigation Satellite Systems for Scientific Applications, held in Trieste, Italy, from 1 to 5 December.

Long-term fellowships for in-depth training

42. The Subcommittee expressed its appreciation to the Government and the Ministry of Industry of Italy, which, through the Politecnico di Torino and the Istituto Superiore Mario Boella and with the collaboration of the Istituto Nazionale di Ricerca Metrologica (INRIM), had provided fellowships for the tenth master class on global navigation satellite systems (GNSS) and related applications, which concluded in September and the eleventh class, which had begun in October 2014.

43. The Subcommittee expressed its appreciation to the Government of Japan for continuing the United Nations/Japan Long-Term Fellowship Programme on Nanosatellite Technologies in cooperation with the Kyushu Institute of Technology.

44. The Subcommittee expressed its appreciation to the Government of Germany, which, in collaboration with the Center of Applied Space Technology and Microgravity at Bremen University and the German Aerospace Center (DLR), had successfully conducted the first cycle of its drop tower experiment series.

2. Year 2015

Meetings, seminars, symposiums, training courses and workshops

45. The Subcommittee recommended the approval of the following programme of forums, meetings, symposiums and workshops for 2015:

(a) United Nations/Japan Workshop on Space Weather: Science and Data Products from International Space Weather Initiative Instruments, to be held in Fukuoka, Japan, from 2 to 6 March;

(b) United Nations/Russian Federation Workshop on the Applications of the Global Navigation Satellite System (GLONASS), to be held in Krasnoyarsk, Russian Federation, from 18 to 22 May;

(c) United Nations/Austria Symposium on Integrated Space Technology Applications for Climate Change, to be held in Graz, Austria, from 7 to 10 September;

(d) United Nations/Islamic Republic of Iran Workshop on the Use of Space Technology for Dust Storm and Drought Monitoring in the Middle East Region, to be held in Tehran from 26 to 30 September;

(e) United Nations/South Africa Symposium on Basic Space Technology, to be held in Cape Town, South Africa, in September;

(f) United Nations/International Astronautical Federation Workshop on Space Technology for Socioeconomic Benefits, to be held in Jerusalem, Israel, from 9 to 11 October;

(g) United Nations/Costa Rica Workshop on Human Space Technology, to be held in San José from 9 to 13 November;

(h) United Nations/United Arab Emirates High-level Forum: Space as a Driver for Socioeconomic Sustainable Development, to be held in Dubai, United Arab Emirates, from 15 to 17 November;

(i) United Nations/Kenya Workshop on Space Technology and Applications for Wildlife Management and Protecting Biodiversity, to be held in Kenya in November;

(j) United Nations International Meeting on Global Navigation Satellite Systems, to be held in Vienna from 14 to 18 December.

B. Regional and interregional cooperation

46. The Subcommittee noted that the schedule of nine-month postgraduate courses for the period 2013-2015 offered by the regional centres for space science and technology education, affiliated to the United Nations, was annexed to the report of the Expert on Space Applications (A/AC.105/1085, annex III).

47. The Subcommittee noted the inauguration of the new regional centre for space science and technology education in Asia and the Pacific, located at Beihang University in Beijing. The Subcommittee also noted the commitment of the Government of China to supporting the work of the centre.

48. The Subcommittee recalled that the General Assembly, in its resolution 68/75, had emphasized the importance of regional and interregional cooperation in the field of space activities to assist States in the development of their space capabilities and contribute to the achievement of the goals of the United Nations Millennium Declaration, and had noted in that regard the importance of the equal participation of women in all fields of science and technology.

49. The Subcommittee noted that the twenty-first session of the Asia-Pacific Regional Space Agency Forum (APRSAF) had been held in Tokyo from 2 to 5 December 2014, on the theme "Leap to the next stage: delivering innovative ideas and solutions". The twenty-second session of APRSAF would be held in Bali, Indonesia, in 2015.

50. The Subcommittee also noted that the eighth meeting of the Council of APSCO had been held in Pakistan on 24 and 25 September 2014, at which it reviewed the progress made on APSCO projects.

51. The Subcommittee noted that the pro tempore secretariat of the Sixth Space Conference of the Americas was continuing the implementation of the Pachuca Declaration, adopted at the Sixth Conference, held in Pachuca, Mexico, from 15 to 19 November 2010.

52. The Subcommittee was informed of the in-cash contributions received from donors in past years, and member States were encouraged to further support the fulfilment of the objectives of the international community in supporting the development of capacity in space science and technology.

III. Space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda

53. In accordance with General Assembly resolution 69/85, the Subcommittee considered agenda item 5, "Space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda".

54. The representatives of Colombia, Egypt, France, Germany and Japan made statements under agenda item 5. During the general exchange of views, statements relating to the item were made by representatives of other member States.

55. The Subcommittee heard the following scientific and technical presentations:

(a) "Blue Dot: shaping the future — ISS mission of the German ESA astronaut Alexander Gerst", by the representative of Germany;

(b) "The Italian activities and contributions to ISS", by the representative of Italy;

(c) "Satellite information to contribute to global health", by the representative of Japan;

(d) "The Office for Outer Space Affairs and partners promoting Earth observation to meet global disaster risk reduction and sustainable development commitments", by the Office for Outer Space Affairs.

56. The Subcommittee had before it the following:

(a) Conference room paper entitled "Revised draft proposed workplan for a mechanism of cooperative deliberation for space and sustainable development: bridging the Committee on the Peaceful Uses of Outer Space and the Scientific and Technical Subcommittee" (A/AC.105/C.1/2015/CRP.15);

(b) Note by the Secretariat entitled "Rio+20 and beyond: towards the post-2015 development agenda" (A/AC.105/C.1/2015/CRP.26);

(c) Conference room paper entitled "First meeting of the expert group on space and global health held on 5 February 2015: report on the proposed mandate, workplan and initial considerations" (A/AC.105/C.1/2015/CRP.29);

(d) Note by the past, present and incoming chairs of the Committee on the Peaceful Uses of Outer Space entitled "2018 'UNISPACE+50' theme of the Scientific and Technical Subcommittee, the Legal Subcommittee and the Committee on the Peaceful Uses of Outer Space" (A/AC.105/C.1/2015/CRP.30).

57. The Subcommittee recalled that the General Assembly, in its resolution 69/85, reiterated the need to promote the benefits of space technology and its applications in the major United Nations conferences and summits for economic, social and cultural development and related fields, and recognized that the fundamental significance of space science and technology and their applications for global, regional, national and local sustainable development processes should be promoted in the formulation of policies and programmes of action and their implementation, including through efforts towards achieving the objectives of those conferences and summits, including implementing the Millennium Declaration and contributing to the post-2015 development agenda process.

58. The Subcommittee also recalled that, in that resolution, the Assembly encouraged Member States, to that end, to promote the inclusion in those conferences, summits and processes of the relevance of space science and technology applications and the use of space-derived geospatial data.

59. The Subcommittee noted the effective role of space science and technology and their applications and geospatial information in areas such as tele-health and tele-epidemiology, tele-education, disaster management, climate change, environmental protection, urban and rural development and Earth monitoring, as well as their contribution to economic, social and cultural development.

60. The Subcommittee noted with satisfaction that a panel discussion on space and sustainable development within the context of the post-2015 development agenda, organized by the Office for Outer Space Affairs, was held on 15 October 2014 during the plenary deliberations by the Fourth Committee of the General Assembly on international cooperation in the peaceful uses of outer space.

61. The Subcommittee noted with appreciation that the eleventh open informal session of UN-Space, entitled "Engaging space tools for development on Earth: contribution of space technology and applications to the post-2015 development agenda" was organized by the Office for Outer Space Affairs and held on 14 May 2014 in New York. The Subcommittee noted that a half-day high-level panel would be organized in conjunction with the joint United Nations/Germany Conference, to be held in Bonn from 26 to 28 May 2015; the title of the event would be "UN-Space-Bonn Conference high-level panel on space-based information for development".

62. Some delegations urged UN-Space to continue to examine ways in which space science and technology and their applications could contribute to the implementation of the Millennium Declaration and the post-2015 development agenda.

63. The view was expressed that the sustainable development goals should not be renegotiated with a view to including space technology, given the progress achieved by the Open Working Group of the General Assembly on Sustainable Development Goals. The delegation in question was of the view that space technology could be a fundamental tool for measuring, monitoring and evaluating the implementation of the post-2015 development agenda.

64. The view was expressed that the Subcommittee should continue its work to embed the use of space technology in the United Nations system.

65. The view was expressed that it was important to continue discussions on the use of space technology for socioeconomic development under the post-2015 development agenda, and that effective sharing of space-based data remained one of the important applications that could support achieving national objectives under the post-2015 development agenda.

66. The view was expressed that space activities should be considered an effective driver of economic growth and spin-off innovations for the benefit of humankind, and that progress in the peaceful uses of outer space would promote equitable and balanced development.

67. The view was expressed that the international community, especially developed countries, should step up their contributions towards bridging existing scientific and technological gaps by building capability in and sharing know-how with developing countries, and that without such support the goal of all-inclusive global development might not be achievable.

68. The view was further expressed that it was important to bridge the existing gaps in space technology capabilities and that the transfer of knowledge of space technology remained a key factor for building national capacity of Member States, which in turn could play a significant role in the attempt to make the space environment more sustainable.

69. The Working Group of the Whole was reconvened under the chairmanship of V. K. Dadhwal (India), in accordance with paragraph 8 of General Assembly resolution 69/85. At its 842nd meeting, on 12 February, the Subcommittee endorsed the report of the Working Group of the Whole, which is contained in annex I to the present report.

IV. Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment

70. In accordance with General Assembly resolution 69/85, the Subcommittee considered agenda item 6, "Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment".

71. The representatives of Belarus, Brazil, Canada, China, Colombia, Egypt, India, Indonesia, Italy, Japan, Pakistan, South Africa and the United States made statements under agenda item 6. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

72. The Subcommittee heard the following scientific and technical presentations:

(a) "Initiatives of the Federal Space Agency relating to the use of remote sensing data in the interests of sustainable development", by the representative of the Russian Federation;

(b) "NOAA meteorological satellite update", by the representative of the United States;

(c) "Introduction to application achievement of the GF-1 and GF-2 satellites", by the representative of China;

(d) "The Global Water Initiative", by the observer for the International Space University;

(e) "ISPRS is serving society with information from images", by the observer for the International Society for Photogrammetry and Remote Sensing;

(f) "Copernicus, a European achievement", by the observer for ESA;

(g) "Sixth PSIPW award winners", by the observer for PSIPW.

73. In the course of the discussions, delegations reviewed national, bilateral, regional and international programmes on remote sensing, notably in the following areas: monitoring climate change; disaster management; monitoring geological processes; volcanology and seismology; managing ecosystems and natural resources; monitoring air and water quality; meteorology; agriculture and fishery; irrigation; monitoring deforestation and forest degradation; mapping biodiversity resources, coastal zones, watershed development and land use; ice-cover monitoring; oceanography; wildlife habitat assessment; rural development and urban planning; global health; and food security and crop yield quantification.

74. The Subcommittee noted the importance of space-technology-based data, in situ monitoring and reliable geospatial information for sustainable development

policymaking, programming and project operations, as stressed in the outcome document of the United Nations Conference on Sustainable Development "Rio+20" (A/CONF.216/16). The Subcommittee noted that comprehensive, coordinated and sustained Earth observation systems provided essential benefits to humankind and that they continued to play an important role in the post-2015 development agenda.

75. The Subcommittee noted significant capacity-building efforts by developing countries in using Earth observation to fight poverty, improve quality of life and advance their socioeconomic development through a rational and sustainable exploitation of resources. In this regard the Subcommittee also noted the capacity-building efforts in remote sensing undertaken by the regional Centre for Space Science and Technology Education for Asia and the Pacific.

76. The Subcommittee reaffirmed the importance of international cooperation in Earth observation activities and took note of a number of regional and international initiatives aimed at strengthening the use of remote sensing data to make well-informed decisions, in particular for the benefit of developing countries, such as the Regional Visualization and Monitoring System (SERVIR), supported by the United States, the Space Applications for Environment (SAFE) initiative of APRSAF, and the Land Cover Classification System of the Food and Agriculture Organization of the United Nations.

77. The Subcommittee noted a number of existing operational Earth observation satellites that provided high-resolution, high-accuracy and sustained observation of the Earth environment, and a number of forthcoming launches of Earth observation satellites. It also noted plans to develop and build such satellites jointly and plans for a new generation of high-resolution Earth observation systems. Combined with ground-based systems, all of those could further improve the monitoring of the Earth environment.

78. The Subcommittee also noted the increased availability of space-based data at little or no cost. Those include remote sensing data from sources such as Landsat of the United States, the Constellation of Small Satellites for Mediterranean Basin Observation (COSMO-SkyMed) of Italy, the Greenhouse Gases Observing Satellites of Japan, the China-Brazil Earth resources satellites (CBERS), the Megha-Tropiques and the Satellite for Argos and AltiKa (SARAL) joint satellite missions of France and India, the joint remote sensing satellite constellation of Belarus and the Russian Federation, and the Sentinel satellites of the ESA Copernicus programme. The Subcommittee also took note of joint development plans for two Earth observation satellites undertaken by Algeria and South Africa as part of the African Resource Management constellation.

79. The Subcommittee noted the continued support for the activities of the Committee on Earth Observation Satellites (CEOS), which at its twenty-eighth plenary session in Tromsø, Norway, in November 2014 made a commitment to improving availability of global space-based climate data, integrating satellite and ground-based observations, and enhancing disaster risk management. The Subcommittee also noted that, at that plenary session, the Japan Aerospace Exploration Agency took up the chairmanship of CEOS for 2015.

80. The Subcommittee noted the continued support for efforts of the Group on Earth Observations (GEO) to develop a Global Earth Observation System of Systems (GEOSS) and develop its next 10-year implementation plan. The

Subcommittee also noted that the next GEO ministerial summit will be held on 13 November 2015 in Mexico City.

81. The Subcommittee noted that the Sixth Space Congress, held in Minsk in 2014, had addressed, among other issues, new methods for processing remote sensing imagery and noted the proposal for a joint United Nations/Belarus workshop on remote sensing, to be organized on the margins of the Seventh Space Congress in 2016.

82. The Subcommittee noted the importance of data democracy policies aimed at empowering users in developing countries so that they can make full use of remote sensing data and applications to address various issues of societal relevance.

83. The Subcommittee also noted the growing involvement of private entities in Earth observation. In this regard, the Subcommittee noted that it was important to have appropriate national regulatory frameworks in place to ensure that remote sensing data are utilized and distributed in a responsible manner.

84. The view was expressed that all nations should consider creating effective regulatory frameworks for remote sensing, such as the Remote Sensing Systems Act recently adopted by Canada, and in doing so should review the report of the Working Group of the Legal Subcommittee on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space for further guidance (see A/AC.105/1045).

V. Space debris

85. In accordance with General Assembly resolution 69/85, the Subcommittee considered agenda item 7, "Space debris".

86. The representatives of Brazil, Canada, China, Cuba, Egypt, Germany, India, Indonesia, Italy, Japan, Pakistan, the Russian Federation, Saudi Arabia, Switzerland, the United States and Venezuela (Bolivarian Republic of) made statements under agenda item 7. A statement was made under the item by the representative of Chile on behalf of the Group of Latin American and Caribbean States. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

87. The Subcommittee heard the following scientific and technical presentations:

(a) "United States space debris environment, operations and measurements updates", by the representative of the United States;

(b) "The Inter-Agency Space Debris Coordination Committee (IADC) — an overview of the IADC annual activities", by the representative of the United States;

(c) "Overview of the 2014 space debris activities in France", by the representative of France;

(d) "KIAM[1] space debris data centre for processing and analysing information on space debris obtained by the ISON network", by the representative of the Russian Federation;

(e) "The RemoveDEBRIS mission", by the representative of the United Kingdom;

(f) "Space debris mitigation activities at ESA in 2014", by the observer for ESA;

(g) "Lessons learned from space failures", by the observers for IAASS.

88. The Subcommittee had before it the following:

(a) Information on national research on space debris, the safety of space objects with nuclear power sources on board and problems relating to the collision of such objects with space debris, in replies received from Member States and international organizations (A/AC.105/C.1/109 and Add.1, A/AC.105/C.1/2015/CRP.7, A/AC.105/C.1/2015/CRP.8 and A/AC.105/C.1/2015/CRP.16);

(b) Conference room paper entitled "Compendium of space debris mitigation standards adopted by States and international organizations" (A/AC.105/C.1/2015/CRP.9).

89. The Subcommittee expressed concern at the increasing amount of space debris and encouraged those States which had not yet done so to consider voluntary implementation of the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space.

90. The Subcommittee agreed that States, in particular spacefaring nations, should pay greater attention to the problem of collisions of space objects, including those with nuclear power sources on board, with space debris and to other aspects of space debris, including its re-entry into the atmosphere.

91. The Subcommittee noted with satisfaction that some States were implementing space debris mitigation measures consistent with the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space and/or the Inter-Agency Space Debris Coordination Committee (IADC) Space Debris Mitigation Guidelines, and that a number of States had developed their own space debris mitigation standards based on those guidelines.

92. The Subcommittee noted that other States were using the IADC Guidelines and the European Code of Conduct for Space Debris Mitigation as reference points in their regulatory frameworks for national space activities. The Subcommittee also noted that other States had cooperated, in the framework of the ESA space situational awareness programme, to address the issue of space debris.

93. The Subcommittee noted with appreciation that States had adopted a number of approaches and concrete actions to mitigate space debris, including the improvement of the design of launch vehicles and spacecraft, the reorbiting of satellites, passivation, end-of-life operations and the development of specific software and models for space debris mitigation.

[1] Keldysh Institute of Applied Mathematics (KIAM).

94. The Subcommittee noted that research was being conducted in the areas of technology for space debris observation and continuous monitoring, space debris re-entry prediction, collision avoidance and modelling of collision probability, in-orbit robotic servicing of satellites, and technologies to protect space systems from space debris and to limit the creation of additional space debris.

95. Some delegations expressed the view that outcomes of the work of working groups of the Subcommittee, such as the Safety Framework for Nuclear Power Source Applications in Outer Space and the Space Debris Mitigation Guidelines of the Committee, should be officially presented to the Legal Subcommittee for examination.

96. Some delegations expressed the view that it was necessary to continue improving the Space Debris Mitigation Guidelines of the Committee and that the Scientific and Technical Subcommittee and the Legal Subcommittee should cooperate with the aim of developing legally binding rules relating to space debris, including debris derived from space platforms with nuclear power sources on board.

97. Some delegations expressed the view that space debris issues could be effectively addressed through the voluntary implementation of space debris mitigation measures by means of national mechanisms.

98. Some delegations expressed the view that countries with highly advanced space programmes should assume their responsibilities in the area of space debris to ensure that the mitigation and removal costs were not passed on to countries with emerging space programmes and that a solution should be sought, in particular for space debris of large dimensions that could potentially generate multiple fragments, which would be costly to remove.

99. Some delegations expressed the view that information on actions to reduce the creation of space debris should be made available to the Committee, in particular by those States that were largely responsible for the current situation and those that were able to take measures to reduce space debris.

100. The view was expressed that reporting the status of implementation of the Space Debris Mitigation Guidelines by all spacefaring nations would improve transparency and confidence-building among Member States.

101. Some delegations expressed the view that developing countries should benefit from technical assistance provided by spacefaring nations for monitoring, mitigation and removal of space debris.

102. Some delegations expressed the view that the exchange of knowledge, data and analysis methods among States was essential for meaningful mitigation strategies and remediation measures.

103. The view was expressed that since space debris had been created by the past operations of spacefaring countries, those countries should assist countries with emerging space programmes in the implementation of space debris mitigation measures through the provision of conjunction assessment risk analysis systems and situational awareness systems for the live monitoring of space objects, providing scientific and technological support, including the transfer of relevant technology, without imposing undue costs on the space programmes of the developing nations.

104. The view was expressed that a mechanism should be developed to assist emerging spacefaring nations that did not have the necessary financial and technological resources to comply with the set of debris mitigation guidelines.

105. Some delegations expressed the view that all relevant information related to the re-entry of space debris into the Earth's atmosphere should be reported diligently and expeditiously to countries that might be affected.

106. Some delegations expressed the view that, during the removal of space debris, no unilateral action should be taken by any State with respect to a space object of another State unless a consultation and agreement with regard to that action had been reached with the State of registry of the space object in question.

107. The view was expressed that an advisory group and initiative, similar to those adopted in the Space Mission Planning Advisory Group and the Action Team on Near-Earth Objects (Action Team 14), should be set up to address the issue of remediation solutions with respect to space debris.

108. The view was expressed that a political, legal and institutional framework to implement measures related to in-orbit remediation of the space environment needed to be developed and accepted.

109. The view was expressed that coordinated efforts were required to deal with technological and financial aspects of debris removal.

110. The view was expressed that research should focus on eliminating tiny pieces of space debris that were difficult to track or identify, and that a legal framework should be developed under the United Nations auspices to support activities for the clean-up of the space environment.

111. The view was expressed that special attention should be paid to mitigation measures, such as the removal of massive non-functional spacecraft and launch vehicle stages.

112. The Subcommittee noted with satisfaction that the compendium of standards adopted by States and international organizations to mitigate space debris, initiated by Canada, the Czech Republic and Germany, was made available on the website of the Office for Outer Space Affairs, and encouraged Member States to provide their contributions or updates to the compendium.

113. The Subcommittee took note of paragraph 12 of General Assembly resolution 69/85, and agreed that Member States and international organizations with permanent observer status with the Committee should continue to be invited to provide reports on research on space debris, the safety of space objects with nuclear power sources on board, problems relating to the collision of such space objects with space debris and ways in which debris mitigation guidelines were being implemented.

VI. Space-system-based disaster management support

114. In accordance with General Assembly resolution 69/85, the Subcommittee considered agenda item 8, "Space-system-based disaster management support".

115. The representatives of China, Colombia, Egypt, France, Germany, India, Indonesia, Japan, Pakistan, the Republic of Korea, Saudi Arabia and the United States made statements under agenda item 8. A statement was made under the item by the representative of Chile on behalf of the Group of Latin American and Caribbean States. A representative of the Office for Outer Space Affairs made a statement on the activities of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER). During the general exchange of views, statements relating to the item were also made by representatives of other member States.

116. The Subcommittee heard the following scientific and technical presentations:

(a) "Risk management using space tools: the Algerian experience", by the representative of Algeria;

(b) "Emergency prevention and response with the application of space observation systems", by the representative of the Russian Federation;

(c) "The Italian COSMO-SkyMed constellation support for disaster management and emergency response", by the representative of Italy;

(d) "Progress of space technology applications for disaster management in China", by the representative of China;

(e) "The activations in 2014 of the International Charter on Space and Major Disasters", by the representative of France;

(f) "State of the art and plans for the development of the Russian space system for Earth remote sensing", by the representative of the Russian Federation;

(g) "Iranian forest fire monitoring system", by the representative of Iran (Islamic Republic of);

(h) "Disaster management through the use of space technology for socioeconomic development in Burkina Faso", by the representative of Burkina Faso.

117. The Subcommittee had before it the following:

(a) Report on the United Nations/Germany Expert Meeting on the Use of Space-based Information for Flood and Drought Risk Reduction (A/AC.105/1074);

(b) Report on the knowledge portal of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response: recent advances (A/AC.105/1075);

(c) Report on the United Nations International Conference on Space-based Technologies for Disaster Management: Multi-hazard Disaster Risk Assessment (A/AC.105/1076);

(d) Report on activities carried out in 2014 in the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (A/AC.105/1078);

(e) Report on joint activities carried out in 2014 by the regional support offices of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (A/AC.105/1079);

(f) United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER): indicative workplan for 2015 (A/AC.105/C.1/2015/CRP.13);

(g) Earth observations in support of national strategies for disaster-risk management: a synergy framework for the integration of Earth observation technologies into disaster risk reduction (A/AC.105/C.1/2015/CRP.35).

118. The Subcommittee expressed its appreciation for the efforts of the Office for Outer Space Affairs to bring the reports on the activities of UN-SPIDER in 2014 to its attention, and noted with satisfaction the progress made with regard to most activities planned in the framework of the programme, including the continuing support provided through the programme for emergency response efforts.

119. The Subcommittee noted that in 2014, UN-SPIDER, with support from its network of partners, had carried out missions for advisory support in Bhutan, El Salvador, Kenya, Mongolia and Zambia. The Subcommittee noted with gratitude the capacity-building (training) sessions held in China, Nepal, Sri Lanka and Viet Nam as follow-up to the UN-SPIDER technical advisory missions carried out in previous years.

120. The Subcommittee also acknowledged with appreciation the new developments with respect to the UN-SPIDER knowledge portal (www.un-spider.org), in particular the new improved interface, as well as the availability of French and Spanish versions of the portal.

121. The Subcommittee took note of the planned technical advisory missions to be undertaken by UN-SPIDER in 2015 in Cambodia, Honduras, the Lao People's Democratic Republic, Nepal and the United Arab Emirates and noted the synergies and cross-border actions facilitated by the UN-SPIDER programme, for example, a regional training workshop on space-based information for the estimation of damage and losses, to be held in Bangladesh in April 2015. It also took note of other capacity-building sessions planned, subject to the availability of resources in some cases, in Algeria, Bhutan, Indonesia, Kenya, the Sudan and Latin America.

122. The Subcommittee welcomed the planned outreach activities of UN-SPIDER and its developing partnerships with more than 20 United Nations entities, international organizations and governments to continue promoting the use of space-based tools and information in global and regional initiatives, such as the Third World Conference on Disaster Risk Reduction, to be held in Japan in March 2015, and their use in the context of the post-2015 development agenda. It also noted that complementary relationships between UN-SPIDER and other existing initiatives, including Sentinel Asia, should be further established.

123. The Subcommittee noted with satisfaction the ongoing activities of Member States that were contributing to increasing the availability and use of space-based solutions in support of disaster management and that were supporting the UN-SPIDER programme, through the following activities, among others: the availability of the high-definition television camera system on the International Space Station, Kibo HDTV-EF, for emergency observation in the framework of the International Charter on Space and Major Disasters; the support by the DLR Center for Satellite-based Crisis Information (ZKI) of several operational mapping and analysis tasks for disaster events worldwide, including the contribution of radar

satellite data for 35 of the activations of the International Charter on Space and Major Disasters in 2014; the promotion, through the International Charter on Space and Major Disasters and with the support of UN-SPIDER, of the universal access initiative; the establishment of national and regional data portals for the dissemination of near-real-time information, such as the Pakistan Flood Watch web portal, as well as the production of risk assessments and mapping based on space-based information; the support provided through the United States-funded Famine Early Warning Systems Network and the SERVIR programmes in the Himalayas and Africa; and many further examples of products defined for specific and sectoral end users at the national level.

124. The Subcommittee noted that the International Charter on Space and Major Disasters had been activated more than 440 times since its creation and 40 times alone in 2014. The Subcommittee also noted that Sentinel Asia had been activated 18 times for disasters including floods, earthquakes, volcanic eruptions, landslides and typhoons in Asia.

125. Some delegations expressed the view that partnerships, international agreements and full and open data-sharing arrangements such as in the context of GEO were becoming increasingly important to ensure the effective distribution of space-based data and their use by emergency managers and other responsible authorities worldwide. Various services provided by space agencies in the form of current satellite imagery or information ready for use in geographic information systems were noted.

126. Some delegations requested that the Office for Outer Space Affairs step up international cooperation and coordination through training programmes, in particular for developing countries. Those delegations called on UN-SPIDER to intensify its efforts with respect to Latin America and the Caribbean and, in that regard, to give a positive assessment of the technical visits, cooperation missions and all other activities to train professional teams in the countries of that region.

127. The view was expressed that space-based data could be beneficial in many more disaster situations, not only sudden-onset disasters but also slow-onset disasters, and that more support was needed to make space-based data widely available for monitoring unusual situations such as locust invasions or even terrorism-affected events.

128. The Subcommittee noted that the Office for Outer Space Affairs had hosted the sixth annual meeting of the regional support offices of UN-SPIDER in Vienna on 5 and 6 February 2015 to review the joint activities implemented in 2014 and to develop a joint workplan for 2015.

129. The Subcommittee noted with satisfaction the signing on 5 February 2015 of an agreement between the Office for Outer Space Affairs and the International Water Management Institute headquartered in Sri Lanka for the creation of a new regional support office of UN-SPIDER.

130. The Subcommittee welcomed the fact that the now 17 regional support offices of UN-SPIDER continued to successfully contribute to the activities of UN-SPIDER (see www.un-spider.org/network/regional-support-offices for further information).

131. The Subcommittee took note of the expert and other in-kind contributions made by Member States and regional support offices in 2014 to all UN-SPIDER

technical advisory missions, as well as their sharing of experiences with other interested countries. Such contributions were considered to be especially valuable given the decrease in voluntary cash contributions made to the UN-SPIDER programme.

132. The Subcommittee noted with appreciation the voluntary contributions that were being made by Member States, including the cash contributions from China and Germany, and encouraged Member States, on a voluntary basis, to provide UN-SPIDER with all necessary support, including increased financial support, to enable it to better respond to Member States' requests for assistance and fully carry out its workplan for the next biennium.

VII. Recent developments in global navigation satellite systems

133. In accordance with General Assembly resolution 69/85, the Subcommittee considered agenda item 9, "Recent developments in global navigation satellite systems", and reviewed issues related to the International Committee on Global Navigation Satellite Systems (ICG), the latest developments in the field of GNSS and new GNSS applications.

134. The representatives of Brazil, Canada, China, Colombia, Egypt, India, Italy, Japan and the United States made statements under agenda item 9. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

135. The Subcommittee heard the following scientific and technical presentations:

(a) "Opportunities of the Krasnoyarsk region in the sphere of outer space and related technologies", by the representative of the Russian Federation;

(b) "GLONASS: current status, modernizations and use", by the representative of the Russian Federation;

(c) "The first videoconference using the Q/V band: a new era in satellite telecommunication history", by the representative of Italy;

(d) "Update on the BeiDou Navigation Satellite System" by the representative of China.

136. The Subcommittee had before it the following:

(a) Note by the Secretariat on the ninth Meeting of the International Committee on Global Navigation Satellite Systems (A/AC.105/1083);

(b) Report of the Secretariat on activities carried out in 2014 in the framework of the workplan of the International Committee on Global Navigation Satellite Systems (A/AC.105/1084);

(c) Report on the United Nations/Abdus Salam International Centre for Theoretical Physics Workshop on the Use of Global Navigation Satellite Systems for Scientific Applications (A/AC.105/1087).

137. The Subcommittee was informed that the Office for Outer Space Affairs, as the executive secretariat of ICG, handled coordination for the planning of meetings of ICG and its Providers' Forum in conjunction with sessions of the Committee and

its subsidiary bodies. It was noted that the executive secretariat also maintained a comprehensive information portal for ICG and users of GNSS services and continued to play an active role in promoting international cooperation to use the capabilities of GNSS to support sustainable development.

138. The Subcommittee noted that the Office for Outer Space Affairs, in the framework of the ICG programme on GNSS applications, organized activities that focused on building capacity in satellite navigation science and technology. Those activities included sessions on space weather and ionospheric research in an effort to initiate space science research programmes in developing countries and to support existing projects in the field of ionospheric research using GNSS techniques.

139. The Subcommittee also noted that the regional centres for space science and technology education, affiliated to the United Nations, had started to use the GNSS education curriculum developed by ICG and its Providers' Forum. Those centres, which also served as information centres for ICG and its Providers' Forum, provided knowledge on current and future developments of satellite navigation systems, including the user segment (receiver), as well as the applications of GNSS technology.

140. The Subcommittee noted that the United Nations/Abdus Salam International Centre for Theoretical Physics Workshop on the Use of Global Navigation Satellite Systems for Scientific Applications had been held in Trieste, Italy from 1 to 5 December 2014. The main objective of the Workshop had been to provide a forum in which participants could share their technical expertise and experiences in science applications of GNSS.

141. The Subcommittee noted with satisfaction that the ninth meeting of ICG and the thirteenth meeting of the Providers' Forum, organized by the European Commission and the European GNSS Agency on behalf of the European Union, had been held in Prague from 10 to 14 November 2014, hosted by the European GNSS Agency. It was noted that the tenth meeting of ICG would be organized by the United States and held in Boulder, Colorado, United States, from 1 to 6 November 2015. The Subcommittee also noted the expression of interest by the Russian Federation in hosting the eleventh meeting of ICG in 2016.

142. The Subcommittee noted that the ICG working groups focused on the following issues: compatibility and interoperability; enhancement of the performance of GNSS services; information dissemination and capacity-building; and reference frames, timing and applications. The Subcommittee also noted that the working groups had made substantive progress in furthering the workplans of ICG and its Providers' Forum.

143. The Subcommittee noted that the Providers' Forum had considered Medium-Earth Orbit Search and Rescue (MEOSAR) as an application for use in the International Satellite System for Search and Rescue (COSPAS-SARSAT). It was noted that MEOSAR was the next generation of satellite-aided search and rescue and was in the testing phase.

144. The Subcommittee noted that 2015 marked the tenth anniversary of the establishment of ICG under the auspices of the United Nations. It was highlighted that ICG had been highly successful in bringing together the providers and users of

GNSS to promote its use and integration into infrastructure, particularly in developing countries.

145. The Subcommittee commended the Office for Outer Space Affairs for its outstanding performance in its capacity as the executive secretariat of ICG and its Providers' Forum, and expressed appreciation for the efforts of the Office in bringing attention to the benefits of GNSS throughout the world, particularly for developing nations.

146. The Subcommittee noted with appreciation the financial contributions made by the United States and the European Commission to the Office for Outer Space Affairs in support of GNSS-related activities, ICG and its Providers' Forum.

147. The Subcommittee noted that the Global Positioning System (GPS) of the United States continued to provide a reliable and accurate space-based positioning, navigation and timing service to the international community. It was noted that the constellation continued to fly in a 24+3 constellation to provide excellent coverage and worldwide availability. The entire GPS constellation continued performing at exceptional levels, with an average user range error of 80 centimetres. The Subcommittee also noted that the United States intended to continue improving the accuracy and availability of GPS through improved satellite and clock performance and modernized satellites.

148. The Subcommittee noted that Italy was one of the major players involved in the European satellite navigation programmes: EGNOS and the Galileo satellite navigation system. It was noted that Italy was developing pre-operational projects to pave the way for the full exploitation of the potential of those systems and hosted one of the four control centres of EGNOS and one of the two control centres of Galileo.

149. The Subcommittee noted that the Russian Federation's Global Navigation Satellite System (GLONASS) constellation currently consisted of 28 satellites: 26 GLONASS-M satellites and 2 GLONASS-K satellites, which was a new generation of navigation satellite. The Subcommittee also noted that GLONASS civil services were free and unlimited globally and that the GLONASS Federal Programme was the instrument for implementing national policy on positioning, navigation and timing services. It was noted that there was international cooperation aimed at making GLONASS an essential element of the international GNSS infrastructure, with benefits for users worldwide.

150. The Subcommittee noted that China's BeiDou Navigation Satellite System (BDS) was composed of space, ground and user segments and that it would provide four types of services: open, authorized, wide area differential and short message services. It was also noted that the BDS open service performance standard, demonstrating the commitment of the system to providing a basic performance standard for users, had been published and that the document "BDS signal-in-space interface control document: open service" had been released to publicize the second open signal B2I, and it was highlighted that BDS was to be a satellite navigation system with two civil frequencies and qualified service capabilities.

151. The Subcommittee noted that India was currently implementing its satellite navigation programme in two paths: the GPS-aided GEO-Augmented Navigation System (GAGAN), which was a satellite-based augmentation system, and the Indian

Regional Navigation Satellite System (IRNSS), which was an independent regional system. It was noted that GAGAN had been established to provide increased positional accuracy for civil aviation applications and better air traffic management, and that the availability of the GAGAN signal-in-space would bridge the gap between the coverage areas of EGNOS and Japan's Multi-functional Satellite Augmentation System (MSAS), thereby offering seamless navigation to the aviation industry.

152. The Subcommittee also noted that IRNSS, consisting of a constellation of seven satellites, three in geostationary equatorial orbit and four in geosynchronous orbit (GSO), was in the implementation phase. The first three IRNSS satellites had been launched, and the IRNSS signal-in-space was being successfully broadcast and received. It was noted that the full constellation was expected to be completed by the end of 2015.

153. The Subcommittee noted that the formal operation of the Quasi-Zenith Satellite System (QZSS) of Japan was planned to begin in 2018 and that a constellation of seven satellites would be completed to improve positioning in the Asia-Pacific region. It was noted that in addition to the QZSS positioning function and its function of reinforcement of GPS, QZSS could provide a messaging service that would contribute to disaster management.

154. The view was expressed that local training devices had the capacity to disrupt GNSS services applications. The delegation expressing that view encouraged Member States to adopt at the national level measures to protect GNSS frequencies.

155. The Subcommittee noted with appreciation that Brazil, Canada, Colombia and Egypt had reported on their projects and activities focused on helping to bring GNSS technology to the widest possible user community, as well as the participation of international partners in those programmes.

VIII. Space weather

156. In accordance with General Assembly resolution 69/85, the Subcommittee considered agenda item 10, "Space weather".

157. The representatives of Brazil, Canada, China, Egypt, Germany, Italy, Japan, Mexico, Pakistan, the Republic of Korea, Saudi Arabia and the United States made statements under agenda item 10. During the general exchange of views, statements relating to the item were made by representatives of other member States.

158. The Subcommittee heard the following scientific and technical presentations:

(a) "Space weather monitoring in Russia: current status and prospects for further development", by the representative of the Russian Federation;

(b) "Recent activities of NICT space weather research and operation", by the representative of Japan;

(c) "Space weather services in China", by the representative of China;

(d) "Variability of the Sun and its Terrestrial Impact (VarSITI) — SCOSTEP's New Scientific Programme" and "SCOSTEP capacity-building

activities that enhance space weather understanding", by the observers for SCOSTEP.

159. The Subcommittee noted that space weather was of concern to all nations and that joint international efforts were required in monitoring, research, the improvement of modelling capabilities for forecasting and developing and delivering real-time services for space weather, all of which were indispensable for predicting and mitigating the negative effects of space weather on space-based and ground-based technological infrastructure and human lives.

160. The Subcommittee took note of the progress made to advance space weather capabilities at the national level, such as developing national space weather programmes and the inclusion of space weather in the national preparedness plans; at the regional level, such as within the space situational awareness programme of ESA and the Asia-Oceania Space Weather Alliance (AOSWA); and at the international level, including the Committee on Space Research (COSPAR)/International Living With a Star (ILWS) space weather road map, the efforts of WMO to expand its role in space weather information and services and the plans of ICAO to form an export group with a view to developing provisions for space weather information for international air navigation. In this regard, the Subcommittee encouraged States members of the Committee and national and international organizations to further their cooperation towards achieving a global capability to monitor space weather events from space and the ground, share data to better forecast and mitigate the impacts of space weather on Earth and the space environment.

161. The Subcommittee expressed appreciation for the United Nations Programme on Space Applications, its Basic Space Science Initiative, under which space weather activities are conducted, and the International Space Weather Initiative, which contributed to observation and the development of space weather activities through the worldwide deployment of instrument arrays and the sharing of the observed data among research efforts worldwide. In that regard, the Subcommittee also noted the forthcoming United Nations/Japan Workshop on Space Weather, to be held in Fukuoka, Japan from 2 to 6 March 2015.

162. The Subcommittee welcomed with appreciation the workshop entitled "Space weather services to build global resilience", organized by the United States on the margins of the Subcommittee's fifty-second session, which provided an overview of some of the broad and diverse space weather activities and services currently being undertaken in member States and related national and international organizations, and addressed some of the key issues of maintaining the long-term sustainability of outer space activities.

163. The Subcommittee noted with satisfaction that on the margins of its fifty-second session, the Expert Group on Space Weather, whose establishment was endorsed by the Committee on the Peaceful Uses of Outer Space at its fifty-seventh session, in 2014, had met under the leadership of Canada, to define its programme of work, drawing on the best practices of the work of expert group C on space weather of the Working Group on the Long-term Sustainability of Outer Space Activities.

164. The Expert Group on Space Weather submitted its proposed mandate, workplan and the report on its first meeting to the Subcommittee at its fifty-second session (A/AC.105/C.1/2015/CRP.27).

165. In its report on the first meeting, presented by the rapporteur of the Expert Group on Space Weather, the Group reiterated the importance of continuing and expanding space weather monitoring and of developing more advanced space weather models and forecasts, and expressed a desire for increased communication, coordination and capacity-building to meet the needs of the global space weather endeavour. In that regard, discussions at the first meeting of the Expert Group included proposals that the Group could: (a) review the content, structure and organization of ongoing efforts in the field of space weather; (b) identify where additional coordination might be required or be appropriate and/or identify opportunities and areas for additional contributions by member States, international intergovernmental organizations and non-governmental organizations; (c) propose steps to enhance space weather coordination with specialized bodies, including United Nations agencies (such as WMO and ICAO, among others), and facilitate collaboration with other space weather initiatives; (d) promote the importance and scope of the impacts of space weather on technology infrastructure; and (e) encourage the completion of studies on the impacts of space weather and the socioeconomic effects in Member States.

166. In view of the increased importance of communication between space weather stakeholder entities, the Expert Group also discussed the value of potential workshops and sharing of information between member States in relation to space weather, possibly including a dedicated web-based resource. Significant importance was also attached to the completion of space weather impact studies, and it was notated that the work completed by, for example, the United Kingdom had demonstrated the value of highlighting the important impacts of space weather and taking steps to mitigate their damaging effects.

167. The Expert Group was also informed that WMO had developed a four-year plan for space weather coordination activities aiming to enable, improve and deliver operational space weather services, in particular in response to ICAO requirements for space weather services for air navigation. The Group encouraged that initiative, which was expected to make an important contribution to the objectives of the Expert Group. Consistent with the conclusions of the expert group C of the Working Group on Long-term Sustainability of Outer Space Activities, the first meeting of the Expert Group on Space Weather had also highlighted the importance of space weather in relation to space debris and for the accurate prediction of the re-entry trajectories of objects from their space orbits.

168. The Subcommittee noted that in the face of ever-growing understanding of the potential severity, likelihood and impacts of adverse space weather, the Expert Group on Space Weather played an important role in fostering more synergy and in promoting the convergence of common interest among States members of the Committee and related national and international organizations in space weather efforts.

169. At its 822nd meeting on 5 February 2015, the Subcommittee endorsed the mandate and workplan of the Expert Group on Space Weather, which read as follows:

1. The mandate of the Expert Group on Space Weather is to promote awareness, provide guidance and enable communication and cooperation in space weather-related activities among States members of the Committee and related national and international organizations.

2. Under its workplan, the Expert Group on Space Weather will do the following:

(a) Examine the report and conclusions of the expert group C on space weather of the Working Group on the Long-term Sustainability of Outer Space Activities, as contained in document A/AC.105/C.1/2014/CRP.15, and other information related to space weather, including the recent report from the COSPAR-ILWS road map team entitled "Understanding Space Weather to Shield Society". The Group will examine the guidelines, recommendations and best practices to identify mechanisms to promote their implementation, including an assessment of prioritization (Year 1);

(b) Complete an inventory of relevant United Nations organizations, including the World Meteorological Organization (WMO), the International Civil Aviation Organization (ICAO) and others, and those within States members of the Committee and national and international organizations. Identify and assess their role in the global space weather effort, promote coordination and communication between them, and ensure that the efforts of the Scientific and Technical Subcommittee are complementary (Years 1-2);

(c) Recognizing the impacts of space weather, the Expert Group will promote increased and expanded involvement by member States in providing space weather monitoring, from the ground and in space, and in developing, advancing, sharing and delivering space weather services (Years 2-4);

(d) The Expert Group will report annually to the Subcommittee on its progress, important issues which have been identified, and where specific action is recommended. The group will also make a recommendation for its continuing and future workplan.

IX. Near-Earth objects

170. In accordance with General Assembly resolution 69/85, the Scientific and Technical Subcommittee considered agenda item 11, "Near-Earth objects".

171. The representatives of Egypt, Germany, Italy, Japan, Pakistan, the Republic of Korea, the Russian Federation and the United States, as well as the representative of Chile, on behalf of the Group of Latin American and Caribbean States, made statements under agenda item 11. During the general exchange of views, statements relating to the item were made by representatives of other member States and by the observers for ESA, SGAC and SWF.

172. The Subcommittee heard the following scientific and technical presentations:

(a) "Near-Earth objects 2014", by the representative of the United States;

(b) "Current activities in Russia aimed at addressing near-Earth objects" and "Prospective 'Citadel' international planetary defence system", by the representatives of the Russian Federation;

(c) "Status and activities of newly established groups on near-Earth objects: the International Asteroid Warning Network (IAWN) and the Space Mission Planning Advisory Group (SMPAG)", by the representative of the United States and the observer for ESA;

(d) "NEO event: fireball over Romania", by the representative of Romania;

(e) "The recent status of Hayabusa-2 mission", by the representative of Japan;

(f) "MIRIS: a compact infrared space telescope", by the representative of the Republic of Korea;

(g) "Philae: first landing on a comet", by the representative of Germany.

173. The Subcommittee noted that effective responses for the mitigation of hazard threats from near-Earth objects (NEO) were best addressed through international cooperation and the coordination of related research and knowledge of best practices. The Subcommittee noted, in particular, international cooperation in the construction of telescopes for observation and the characterization of NEOs, the development of unmanned spacecraft to study NEOs, the advancement in technologies for collection of data on NEOs and the development of NEO observation spacecraft.

174. The Subcommittee also noted the importance of information-sharing in discovering, monitoring and physically characterizing potentially hazardous NEOs to ensure that all nations, in particular developing countries with limited capacity in predicting and mitigating an NEO impact, were aware of potential threats. The Subcommittee also recalled the importance of capacity-building in effective emergency response and disaster management in the event of an NEO impact.

175. The Subcommittee noted that in its resolution 68/75, the General Assembly had welcomed with satisfaction the recommendations for an international response to the NEO impact threat as contained in document A/AC.105/1038, annex III, paragraphs 11-14.

176. The Subcommittee noted that in its resolution 69/85, the General Assembly had recalled the recommendations for an international response to the near-Earth object impact threat, endorsed by the Scientific and Technical Subcommittee at its fiftieth session and by the Committee at its fifty-sixth session, and had noted with satisfaction that progress on establishing an international asteroid warning network and a space mission planning advisory group to implement the recommendations for an international response to the near-Earth object impact threat would be reported to the Subcommittee at its fifty-second session.

177. The Subcommittee recalled its earlier agreement that the work of the International Asteroid Warning Network (IAWN) and of the Space Mission Planning Advisory Group (SMPAG) should be facilitated by the United Nations and noted

that the Action Team on Near-Earth Objects, established by the Committee on the Peaceful Uses of Outer Space in 2001, should assist in the establishment of IAWN and SMPAG and should inform the Subcommittee of the progress in their establishment, and that, once established, IAWN and SMPAG should report on an annual basis on their work.

178. The Subcommittee recalled that the core membership of the ad hoc steering committee of IAWN had been established (A/AC.105/1065, para. 171) at its first meeting, held under the auspices of the Action Team and hosted by the Minor Planet Center in Cambridge, Massachusetts, United States, on 13 and 14 January 2014. At that meeting, members of the ad hoc steering committee recognized that there was a need to invite other relevant organizations to participate in and contribute to IAWN.

179. The Subcommittee noted that the Action Team had met on 11 June 2014, on the margins of the fifty-seventh session of the Committee, to plan future work on the establishment of IAWN and to make preparations for the second meeting of SMPAG, which was held on 12 and 13 June 2014. The Subcommittee further noted that at the second meeting of SMPAG, among other things, the following had been achieved:

(a) The meeting had finalized the draft terms of reference for SMPAG and agreed on a version considered final;

(b) ESA had been formally and unanimously elected as Chair of SMPAG for the next two years;

(c) The need for transparency and open communication had been emphasized. Consequently, it was decided to accept observers with expertise in fields relevant to the topic of planetary defence at the meetings of SMPAG;

(d) A draft task list of activities had been identified, from which a workplan document would be produced. It had been agreed to assign task leaders to coordinate the task activities and the production of a report. Some members of SMPAG had already volunteered to be task leaders;

(e) It had been agreed that the next SMPAG steering committee meeting would take place on the margins of the fifty-second session of the Scientific and Technical Subcommittee and that the next full meeting of SMPAG would take place in Frascati, Italy, on 9 and 10 April 2015, just before the 2015 Planetary Defense Conference.

180. The Subcommittee noted that as of its fifty-second session, SMPAG had 14 official members, that one space agency had officially requested to join SMPAG and that two other space agencies had indicated their intention to become members. The Subcommittee further noted that to date 10 activities on the task list of SMPAG had been agreed and that for five of those activities lead agencies had been identified to coordinate the work to be done.

181. The Subcommittee was informed that on 9 and 10 September 2014, the Action Team, in collaboration with NASA and SWF, had organized a workshop at Broomfield, Colorado, United States, on communication strategies for IAWN regarding NEO impact hazards. The main findings of the workshop included the following:

(a) The fundamental principles of risk communication are well defined and widely embraced;

(b) Cultivating and maintaining public trust, issuing notifications and warnings in a timely fashion, maintaining transparency in communications, understanding its various audiences and planning for a range of scenarios are important to effectively communicate NEO impact hazards and risks;

(c) IAWN needs to operate as a global, round-the-clock communications network in order to become a trusted and credible source of information;

(d) Employing, in the various IAWN institutions, a common language to communicate about asteroid impact hazards could help IAWN build its identity and credibility. Establishing mechanisms for routine communication could help increase awareness.

182. In view of the above findings, workshop participants formulated recommendations for IAWN, including the following:

(a) IAWN should establish a five-year plan with near- and mid-term actions for becoming the global trusted and credible NEO information, notification and warning network. This plan should consider the fundamental principles of risk communication;

(b) IAWN should sponsor briefings and workshops for news media reporters to improve NEO education in the mass media community.

183. The Subcommittee noted that the steering committee of IAWN held a meeting on 11 November 2014 in conjunction with the forty-sixth annual meeting of the Division of Planetary Sciences of the American Astronomical Society. The Steering Committee heard presentations from multiple NEO characterization projects on their current capabilities and activities. A final draft of the letter of intent for IAWN participation was presented and discussed. Further information can be found at www.minorplanetcenter.net/IAWN.

184. The Subcommittee noted that the Action Team had successfully carried out its work to establish IAWN and SMPAG and considered its assigned tasks completed. As IAWN and SMPAG would provide annual progress reports to the Subcommittee on the preparation of an international response to the near-Earth object impact threat, the Action Team had recommended that it should be dissolved.

185. The Subcommittee noted with appreciation the work of the Action Team on Near-Earth Objects and commended its achievements in coordinating international NEO hazard threat mitigation efforts, in particular through its work to establish IAWN and SMPAG. The Subcommittee also thanked the Chair of the Action Team, Sergio Camacho (Mexico), for his dedicated work.

186. The Subcommittee noted that the Action Team had recommended that in 2016 IAWN should hold a meeting as an open forum to discuss its workplan and other

NEO-related activities. That meeting could be held on the margins of the fifty-third session of the Scientific and Technical Subcommittee in order to enable the participation of interested delegations.

187. The Subcommittee noted that the Action Team further recommended that IAWN and SMPAG should seek permanent observer status with the Committee.

188. The Subcommittee noted that the Action Team had identified that additional work would be required regarding the decision-making and implementation framework necessary for the development of the international community's capabilities for dealing with NEO threats. That work should also take account of the need for establishing an institutional and juridical framework for decisions regarding NEO defence operations and the related responsibilities.

189. The Subcommittee was also informed that on 5 and 6 February 2015, in collaboration with the Action Team on Near-Earth Objects, the first meeting of the SMPAG steering committee took place on the margins of the Subcommittee's session. Representatives of the following entities participated: Agenzia Spaziale Italiana, Centre national d'études spatiales of France, DLR of Germany, European Space Agency, IAWN, Japan Aerospace Exploration Agency, Israel Space Agency, NASA of the United States, Romanian Space Agency, Space and Upper Atmosphere Research Commission of Pakistan and UK Space Agency. In addition, representatives of the Action Team on Near-Earth Objects and the Office for Outer Space Affairs and Austria, Canada, India and Oman were present.

190. The Subcommittee was informed that the application of the Israel Space Agency for participation in SMPAG had been formally accepted at the meeting.

191. The Subcommittee was informed of the following information resulting from that meeting:

(a) The SMPAG steering committee agreed on a first official version of the terms of reference of SMPAG;

(b) Discussions were held on the criteria to be used for participation in the SMPAG steering committee and plenary meetings. As to the status of observers, it was agreed that they may be invited to meetings pending their prior application and acceptance by the chair of the meeting;

(c) Delegations agreed to formally invite the Office for Outer Space Affairs to attend SMPAG meetings as an observer;

(d) It was agreed that the SMPAG steering committee would meet twice per year;

(e) Discussions were held on the general structure and specific work activities of the SMPAG workplan, including the schedule;

(f) It was agreed that the SMPAG workplan should be a living document including completed, ongoing and planned activities.

X. Use of nuclear power sources in outer space

192. In accordance with General Assembly resolution 69/85, the Subcommittee considered agenda item 12, "Use of nuclear power sources in outer space".

193. The representatives of China, the United States and Venezuela (Bolivarian Republic of), and the representative of Chile on behalf of the Group of Latin American and Caribbean States, made statements under agenda item 12. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

194. The Subcommittee heard the following scientific and technical presentations:

(a) "A trial set of safety recommendations to implement the guidance for governments section of the Safety Framework", by the representative of the United Kingdom;

(b) "Space nuclear power systems: update on activities and programmes in the United Kingdom", by the representative of the United Kingdom.

195. The Subcommittee encouraged States and international intergovernmental organizations to begin or to continue implementing the Safety Framework for Nuclear Power Source Applications in Outer Space (A/AC.105/934).

196. The view was expressed that the Safety Framework would facilitate the conduct of missions involving nuclear power sources (NPS) on a bilateral and multilateral basis between States and international intergovernmental organizations. The delegation expressing that view was also of the view that the widespread implementation of the Safety Framework would provide assurance to the global community that NPS applications were being developed, launched and used in a safe manner.

197. Some delegations expressed the view that the Safety Framework, in its present form, was not adequate to meet the challenges posed by the use of NPS in outer space and that their proliferation in outer space, including in terrestrial orbits, should not be allowed, as the effects of NPS on humankind and the environment had not been assessed and there was no definite framework establishing responsibilities and introducing technical and legal tools that could effectively address critical situations that might arise because of improper practices.

198. Some delegations expressed the view that the Safety Framework provided a comprehensive and adequate foundation of guidance for member States and international intergovernmental space organizations to develop and operate their own space NPS applications in a safe manner. The delegations expressing that view were also of the view that adherence to the Safety Framework and the Principles Relevant to the Use of Nuclear Power Sources in Outer Space provided a high level of assurance that space NPS missions would be safe.

199. Some delegations expressed the view that Governments bore international responsibility for national activities involving the use of NPS in outer space conducted by governmental and non-governmental organizations and that the matter concerned all humanity.

200. Some delegations expressed the view that it was for States to regulate any activity related to nuclear power in space, adding that it was the duty of States to observe international standards regulating the use of nuclear power sources in outer space.

201. Some delegations expressed the view that there should be greater coordination and interaction between the Scientific and Technical Subcommittee and the Legal Subcommittee in order to develop binding legal instruments to define the responsibility of States in the use of NPS in outer space and to undertake research on ways and means of optimizing or substituting for the use of nuclear energy in outer space activities.

202. The view was expressed that the use of NPS in outer space should be as limited as possible and that, while they were needed for some interplanetary missions, no justification existed for their use in terrestrial orbits, for which other sources of energy were available that were much safer and had been proved to be efficient.

203. Some delegations expressed the view that more consideration should be given to the use of NPS in terrestrial orbits in order to address the problem of potential collisions of NPS objects, as well as to their accidental re-entry into the Earth's atmosphere. Those delegations were of the view that more attention should be given to that matter through adequate strategies, long-term planning, regulations and the promotion of binding standards, as well as the Safety Framework for Nuclear Power Source Applications in Outer Space.

204. Some delegations expressed the view that States involved in the use of NPS in outer space should be encouraged to share, in technical presentations to the Subcommittee, their NPS safety experiences and best practices, as such sharing would substantiate national commitments to safety.

205. Some delegations expressed the view that the objectives of the Working Group's multi-year workplan should be in conformity with international law, the Charter of the United Nations and the United Nations treaties and principles on outer space, in particular the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.

206. The view was expressed that all member States should be involved in the decision-making and the identification of issues and challenges associated with NPS applications and the Safety Framework and that that would ensure the success of the implementation of the Working Group's workplan. The delegation expressing that view was also of the view that all decisions of the Working Group should be strictly subject to the agreement of the Subcommittee.

207. Pursuant to General Assembly resolution 69/85, the Working Group on the Use of Nuclear Power Sources in Outer Space was reconvened under the chairmanship of Sam A. Harbison (United Kingdom). The Working Group held four meetings.

208. At its 831st meeting, on 12 February, the Subcommittee endorsed the report of the Working Group, which is contained in annex II to the present report.

XI. Long-term sustainability of outer space activities

209. In accordance with General Assembly resolution 69/85, the Subcommittee considered agenda item 13, "Long-term sustainability of outer space activities", under the workplan contained in the report of the Committee on the Peaceful Uses of Outer Space at its fifty-second session[2] and as extended by the Committee at its fifty-seventh session.[3]

210. The representatives of Algeria, Australia, Belarus, Brazil, Canada, China, France, Germany, Japan, Mexico, Pakistan, the Republic of Korea, the Russian Federation, Saudi Arabia, South Africa, Switzerland, the United Kingdom, the United States, and Venezuela (Bolivarian Republic of), as well as the representative of Chile, on behalf of the Group of Latin American and Caribbean States, made statements under agenda item 13. The observer for the Secure World Foundation also made a statement. During the general exchange of views, statements relating to the item were made by representatives of other member States.

211. The Subcommittee heard the following scientific and technical presentations:

(a) "The Commercial Space Transportation Advisory Committee (COMSTAC) model: leveraging private sector input for public-sector regulations", by the representative of the United States;

(b) "Asia-Pacific Regional Space Agency Forum in 2014 (APRSAF-21)", by the representative of Japan;

(c) "Risk to aircraft from space vehicle debris", by the observers for IAASS.

212. The Subcommittee had before it the following:

(a) Note by the Secretariat containing an updated set of draft guidelines for the long-term sustainability of outer space activities (A/AC.105/C.1/L.340);

(b) Working paper by the Chair of the Working Group containing a draft report of the Working Group on the Long-term Sustainability of Outer Space Activities (A/AC.105/C.1/L.343);

(c) Conference room paper containing a proposal by the United States for an additional guideline (A/AC.105/C.1/2015/CRP.10);

(d) Conference room paper containing comments and proposed amendments by Germany on the updated set of draft guidelines (A/AC.105/C.1/2015/CRP.11);

(e) Conference room paper containing a proposal by Belgium for additional text to be inserted in the updated set of draft guidelines (A/AC.105/C.1/2015/CRP.12);

(f) Conference room paper submitted by Brazil containing a proposal for an additional guideline as well as comments and proposed amendments to the updated set of draft guidelines for the long-term sustainability of outer space activities (A/AC.105/C.1/2015/CRP.19);

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[2] A/64/20, para. 161.

[3] A/69/20, para. 199.

(g) Conference room paper submitted by the Group of Latin American and Caribbean States containing a proposal for an additional guideline as well as comments and proposed amendments to the updated set of draft guidelines for the long-term sustainability of outer space activities (A/AC.105/C.1/2015/CRP.19/Rev.1);

(h) Working paper submitted by the Russian Federation entitled "Achievement of a uniform interpretation of the right of self-defence in conformity with the United Nations Charter as applied to outer space as a factor in maintaining outer space a safe and conflict-free environment and promoting the long-term sustainability of outer space activities" (A/AC.105/C.1/2015/CRP.22, to be reissued as a formal document of the fifty-eighth session of the Committee on the Peaceful Uses of Outer Space, in the six official languages of the United Nations), containing a proposal for an additional guideline on "Implementation of operational and technological self-restraints to forestall adverse developments in outer space";

(i) Working paper submitted by the Russian Federation entitled "Considerations regarding the modalities of consolidating the understanding on issues pertaining to the enhancement of the practice in registering space objects in view of the necessity of ensuring the safety of space operations" (A/AC.105/C.1/2015/CRP.23, to be reissued as a formal document of the fifty-eighth session of the Committee on the Peaceful Uses of Outer Space, in the six official languages of the United Nations), containing a proposal for an additional guideline on the subject matter;

(j) Working paper submitted by the Russian Federation entitled "Additional considerations and proposals aimed at building up understanding of the priority aspects, comprehensive meaning and functions of the concept and practices of ensuring the long-term sustainability of outer space activities" (A/AC.105/C.1/2015/CRP.24, to be reissued as a formal document of the fifty-eighth session of the Committee on the Peaceful Uses of Outer Space, in the six official languages of the United Nations), containing proposals for six additional guidelines on various aspects of the subject matter;

(k) Conference room paper submitted by the Islamic Republic of Iran containing a proposed amendment for the proposal for the consolidation of the set of draft guidelines on the long-term sustainability of outer space activities (A/AC.105/C.1/2015/CRP.25);

(l) Conference room paper submitted by France containing comments and proposed amendments to the updated set of draft guidelines (A/AC.105/C.1/2015/CRP.28);

(m) Working paper submitted by the Russian Federation entitled "Proposal on the review and consideration of the concept of a United Nations information platform serving common needs in collecting and sharing information on near-Earth space monitoring in the interests of safety and security of space operations, and its architectural and programmatic aspects" (A/AC.105/C.1/2015/CRP.32, to be reissued as a formal document of the fifty-eighth session of the Committee on the Peaceful Uses of Outer Space, in the six official languages of the United Nations).

213. The Subcommittee also had before it the following:

(a) Note by the Secretariat entitled "Recommendations of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities: views of States members of the Committee on the Peaceful Uses of Outer Space" (A/AC.105/1080);

(b) Submission by the Russian Federation entitled "Identification of cross-linkages between the recommendations contained in the Report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities and the topic of developing the guidelines on the long-term sustainability of outer space activities" (A/AC.105/C.1/2015/CRP.33, to be reissued as an addendum to A/AC.105/1080).

214. In accordance with General Assembly resolution 69/85, the Working Group on the Long-term Sustainability of Outer Space Activities was reconvened under the chairmanship of Peter Martinez (South Africa).

215. The Subcommittee welcomed the progress made since its last session by the Working Group, in accordance with the terms of reference and methods of work of the Working Group.

216. The view was expressed that there was insufficient participation of developing countries in the work of the Working Group and its expert groups, and that their participation should be actively encouraged.

217. Some delegations stressed the importance of accomplishing the work of the Working Group within the time frame outlined in the revised workplan.

218. The view was expressed that haste to finalize the set of guidelines should not compromise careful and necessary consideration of the relevant topics.

219. Some delegations expressed the view that it was important to continue to consider common elements in the work in the Working Group and the recommendations contained in the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities (A/68/189).

220. The view was expressed that transparency and confidence-building measures in outer space activities were indispensable for maintaining the long-term sustainability of the peaceful uses of outer space.

221. The view was expressed that the guidelines on the long-term sustainability of outer space activities would form part of a broader context of measures aimed at fostering the sustainable use of outer space, and that they were intended to support and complement guidance available in existing treaties, principles, guidelines and recommendations.

222. The view was expressed that the United Nations was the only appropriate setting for the creation of guidelines on the long-term sustainability of outer space activities.

223. Some delegations expressed the view that the future set of guidelines on the long-term sustainability of outer space activities should be worked out in such a way that they would provide an opportunity to establish a full-fledged regime for ensuring the safety of space operations.

224. Some delegations expressed the view that the draft guidelines should take into consideration the needs of developing countries and not limit their access to outer space.

225. Some delegations expressed the view that the long-term sustainability of outer space activities unequivocally depended on the non-militarization and non-placement of weapons in outer space.

226. Some delegations expressed the view that the guidelines should take into account the principle of the non-placement of weapons in the space environment.

227. Some delegations expressed the view that the draft guidelines should be consistent with international law, including the five United Nations treaties on outer space, and that the overregulation of space activities would be undesirable.

228. Some delegations expressed the view that the guidelines must acknowledge that the preservation of outer space for the common good of all humankind should be mandatory and that the sustainability of outer space could not be subordinate to internal considerations of States.

229. Some delegations expressed the view that new guidelines should not create new costs or impose technical barriers for developing countries whose activities had little or no impact on the sustainability of space activities.

230. The view was expressed that the guidelines should include practical measures that can be implemented by spacefaring nations.

231. The view was expressed that the guidelines should be forward-looking and encourage the use of new techniques and solutions to address challenges to the long-term sustainability of outer space affairs.

232. The view was expressed that the set of guidelines produced by the Working Group should encompass all aspects relevant to enhancing the long-term sustainability of outer space activities and that the Subcommittee should think ahead and address the increasing population of space debris as a whole.

233. The view was expressed that the guidelines should focus on measures that already exist, and that technical solutions that have yet to reach maturity should be treated as topics for further discussions among experts.

234. Some delegations expressed the view that the ordering and grouping of the draft set of guidelines should be revised in order to make the report containing the draft set of guidelines more operational and user-friendly.

235. The view was expressed that the draft guidelines should be streamlined.

236. The view was expressed that it was important to clarify which paragraphs of document A/AC.105/C.1/L.340 would constitute guidelines and which paragraphs explanatory text.

237. Some delegations expressed the view that the interrelationship between some of the draft guidelines and existing legal obligations required further clarification.

238. The view was expressed that it was necessary to continue to develop consensus on definitions and translations for the terms used in the guidelines.

239. The view was expressed that, in line with international law, the guidelines should use the term "non-governmental entities" rather than "private entities".

240. The view was expressed that private entities operating space objects should also participate in the exchange of orbital information for the reduction of debris and collision avoidance.

241. Some delegations expressed the view that additional guidelines should be added to the updated set of draft guidelines presented in A/AC.105/C.1/L.340.

242. The view was expressed that the guidelines should address the security of critical infrastructure for space activities.

243. Some delegations expressed the view that the draft guidelines should be supplemented with an additional guideline that would encourage States to commit, in their national legal frameworks, to conducting solely activities of a peaceful nature in the outer space environment and, in so doing, to bear in mind the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities.

244. The view was expressed that the recommendations of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities should serve as the basis for working out regulatory functions to support the safety of space operations that were to be duly reflected in the guidelines on the long-term sustainability of outer space activities.

245. The Subcommittee took note of the working paper submitted by the Russian Federation entitled "Proposal on the review and consideration of the concept of a United Nations information platform serving common needs in collecting and sharing formation on near-Earth space monitoring in the interests of safety of space operations, and its architectural and programmatic aspects" (A/AC.105/C.1/2015/CRP.32, to be reissued as a formal document of the fifty-eighth session of the Committee on the Peaceful Uses of Outer Space, in the six official languages of the United Nations).

246. Some delegations expressed the view that a unified platform of information on the monitoring of objects and events in near-Earth orbit, to be hosted by the Office for Outer Space Affairs, could be in a position to qualitatively enhance the accomplishment of the task of sharing information on, and providing the fullest possible aggregate perception of, the situation in outer space. Such an information platform would logically bring significant enhancements to confidence-building in outer space activities and serve the purpose of safeguarding the common space environment.

247. Some delegations expressed the view that the Office for Outer Space Affairs should be requested to conduct a feasibility study, as proposed in conference room paper A/AC.105/C.1/2015/CRP.32, in order to ascertain, in principle, the organizational and technical capabilities available at the Office, which were needed for the establishment and functioning of a United Nations information platform.

248. Some delegations expressed the view that the establishment of a unified platform under the auspices of the United Nations was premature and that consequently, the Office for Outer Space Affairs was not in a position to carry out a

feasibility study as referred to in conference room paper A/AC.105/C.1/2015/CRP.32.

249. Some delegations expressed the view that a dedicated expert group could be established to consider the full spectrum of issues connected with the collecting and sharing of information on near-Earth space monitoring and to consider existing provisions and appropriate procedures for such information exchange related to actual and potential situations in near-Earth space.

250. The Subcommittee noted that the delegation of the Russian Federation had stated that it would consider establishing and leading an informal group of like-minded delegations that would develop a common approach among participating delegations for the assessment and pursuit of the initiative contained in conference room paper A/AC.105/C.1/2015/CRP.32 and present relevant proposals, as they may be formulated, to the Working Group and/or the Subcommittee.

251. The view was expressed that a database of space objects should be made available to all countries, for the safety, security and sustainability of space operations.

252. The view was expressed that space debris had been created through past space operations by countries with advanced space capabilities, and that those States should help new entrants in space activities to mitigate space debris by providing scientific, technological and financial support, in the interest of the long-term sustainability of outer space activities.

253. The view was expressed that legal issues on the long-term sustainability of outer space activities should be discussed in the Legal Subcommittee.

254. The view was expressed that a new agenda item on the legitimate use of force in space should be established.

255. The Subcommittee recalled the agreement of the Committee on the Peaceful Uses of Outer Space at its fifty-seventh session that States members of the Committee should be invited to submit their views on the modalities of making practical use of the recommendations contained in the report of the Group of Governmental Experts, as they related to and/or could prove instrumental in ensuring the safety of space operations, and in the context of the ongoing work of the Scientific and Technical Subcommittee Working Group on the Long-term Sustainability of Outer Space Activities (A/69/20, para. 374). The Subcommittee welcomed the contributions contained in document A/AC.105/1080, and encouraged other member States to submit their contributions before the fifty-eighth session of the Committee.

256. The view was expressed that the contributions contained in document A/AC.105/1080, with possible additional contributions by other member States, established an excellent basis to document the work of the Committee and its Subcommittees in the development and implementation of transparency and confidence-building measures for outer space activities and that it was of the utmost interest of the Committee to rapidly demonstrate leadership in that matter.

257. The Subcommittee noted that the General Assembly, in paragraph 6 of its resolution 69/38, had decided to convene, within existing resources, a joint ad hoc meeting of the Disarmament and International Security Committee

(First Committee) and the Special Political and Decolonization Committee (Fourth Committee) to address possible challenges to space security and sustainability, and to include in the provisional agenda of its seventieth session, under the item entitled "General and complete disarmament", a sub-item entitled "Joint ad hoc meeting of the First and Fourth Committees on possible challenges to space security and sustainability".

258. The Subcommittee requested the Secretariat to report to the Committee at its fifty-eighth session on the preparations for that joint ad hoc meeting and to inform the Committee on the planned format, agenda and procedures for the meeting, as well as on the expected outcome of the meeting and any budget implications.

259. At its 834th meeting, on 13 February, the Subcommittee endorsed the report of the Working Group on the Long-term Sustainability of Outer Space Activities, which is contained in annex III to the present report.

XII. Examination of the physical nature and technical attributes of the geostationary orbit and its utilization and applications, including in the field of space communications, as well as other questions relating to developments in space communications, taking particular account of the needs and interests of developing countries, without prejudice to the role of the International Telecommunication Union

260. In accordance with General Assembly resolution 69/85, the Subcommittee considered agenda item 14, "Examination of the physical nature and technical attributes of the geostationary orbit and its utilization and applications, including in the field of space communications, as well as other questions relating to developments in space communications, taking particular account of the needs and interests of developing countries, without prejudice to the role of the International Telecommunication Union", as a single issue/item for discussion.

261. The representatives of Brazil, Colombia, Saudi Arabia and Venezuela (Bolivarian Republic of) and the representative of Chile, on behalf of the Group of Latin American and Caribbean States, made statements under agenda item 14. The observer for ITU also made a statement under the item. During the general exchange of views, statements relating to the item were made by representatives of member States.

262. The Subcommittee welcomed the information provided in the annual report for 2014 of the Radiocommunication Bureau of ITU on the use of the geostationary satellite orbit and other orbits (www.itu.int/ITU-R/space/snl/report/), as well as other documents referred to in conference room paper A/AC.105/C.1/2015/CRP.6. The Subcommittee invited ITU to continue to submit reports to it.

263. Some delegations expressed the view that the geostationary orbit was a limited natural resource that was at risk of becoming saturated, thereby threatening the sustainability of space activities in that environment; that its exploitation should be rationalized; and that it should be made available to all States, under equitable conditions, irrespective of their current technical capabilities, taking into particular

account the needs of developing countries and the geographical position of certain countries. Those delegations were also of the view that it was important to use the geostationary orbit in compliance with international law, in accordance with the decisions of ITU and within the legal framework established in the relevant United Nations treaties.

264. Some delegations expressed the view that the geostationary orbit, as a limited natural resource clearly in danger of saturation, must be used rationally, efficiently, economically and equitably. That principle was deemed fundamental to safeguarding the interests of developing countries and countries with a certain geographical position, as set out in article 44, paragraph 196.2, of the Constitution of ITU, as amended by the Plenipotentiary Conference held in Minneapolis, United States, in 1998.

265. Some delegations expressed the view that the geostationary orbit was an integral part of outer space and that, therefore, its use should be governed by the provisions of the United Nations treaties on outer space and the ITU regulations.

266. Some delegations expressed the view that the geostationary orbit was part of outer space, that it was not subject to national appropriation by claim of sovereignty, by means of use or occupation or by any other means, including by means of use or repeated use, and that its utilization was governed by the Outer Space Treaty and ITU treaties.

267. Some delegations expressed the view that the geostationary orbit provided unique potential for access to communications and information, in particular for assisting developing countries in implementing social programmes and educational projects and for providing medical assistance.

268. Some delegations expressed the view that, in order to ensure the sustainability of the geostationary orbit, it was necessary to keep that issue on the agenda of the Subcommittee and to explore it further, through the creation of appropriate working groups and legal and technical intergovernmental panels, as necessary.

269. Some delegations expressed the view that the Working Group on the Long-term Sustainability of Outer Space Activities should consider a guideline on ensuring the equitable access of all States to that unique natural resource.

270. The view was expressed that the legal regime for outer space was different from the legal regime for airspace, which was guided by the principle of sovereignty.

XIII. Draft provisional agenda for the fifty-third session of the Scientific and Technical Subcommittee

271. In accordance with General Assembly resolution 69/85, the Subcommittee considered agenda item 15, "Draft provisional agenda for the fifty-third session of the Scientific and Technical Subcommittee".

272. The Subcommittee noted that the Secretariat had scheduled the fifty-third session of the Subcommittee to be held from 15 to 26 February 2016.

273. The Subcommittee noted that, in accordance with General Assembly resolution 69/85, it would submit to the Committee its proposal on the draft provisional agenda for the fifty-third session of the Subcommittee and recommended that the following substantive items be included in the draft provisional agenda:

1. General exchange of views and introduction of reports submitted on national activities.

2. United Nations Programme on Space Applications.

3. Space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda.

4. Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment.

5. Space debris.

6. Space-system-based disaster management support.

7. Recent developments in global navigation satellite systems.

8. Space weather.

9. Near-Earth objects.

10. Use of nuclear power sources in outer space.

    (Work for 2016 as reflected in the extended multi-year workplan of the Working Group (A/AC.105/1065, annex II, para. 9))

11. Long-term sustainability of outer space activities.

    (Work for 2016 as reflected in the multi-year workplan of the Working Group (A/64/20), para. 161) and extended by the Committee at its fifty-seventh session (A/69/20, para. 199))

12. Examination of the physical nature and technical attributes of the geostationary orbit and its utilization and applications, including in the field of space communications, as well as other questions relating to developments in space communications, taking particular account of the needs and interests of developing countries, without prejudice to the role of the International Telecommunication Union.

    (Single issue/item for discussion)

13. Draft provisional agenda for the fifty-fourth session of the Scientific and Technical Subcommittee, including identification of subjects to be dealt with as single issues/items for discussion or under multi-year workplans.

274. The Subcommittee agreed that the topic for the symposium to be organized in 2016 by the Office for Outer Space Affairs should be "The role of industry in space exploration".

275. The Subcommittee noted with concern that during the present session there had not been enough time for deliberations by the Subcommittee and its working

groups to conduct their work with interpretation services. It was noted that during the session, 66 scientific and technical presentations had been delivered. In that connection, the Subcommittee noted the criteria established by the Committee at its fifty-fourth session in 2011 (A/66/20, para. 298) and the agreement by the Subcommittee made at its fiftieth session in 2013 (A/AC.105/1038, para. 242), and considered that it was necessary to revise those criteria in order to secure the necessary time needed for the work of the working groups and to give the Secretariat a clear mandate to implement those criteria. The Subcommittee therefore decided that:

(a) Maximum flexibility should be applied in the scheduling of items;

(b) As a general rule, statements should not exceed 10 minutes;

(c) The number of scientific and technical presentations should be limited to a maximum of three presentations per meeting, presentations should be closely linked to the agenda items of the Subcommittee, and they should not exceed 15 minutes in duration. The Chair should remind delegations if that length of time is exceeded;

(d) Member States and observers of the Committee should communicate to the Secretariat their wish to make scientific and technical presentations and under which item the presentation is to be made, in advance of the session, in order to optimize the plan of work of the session;

(e) Speaking notes for scientific and technical presentations should be provided to facilitate simultaneous interpretation;

(f) A list of presentations should be made available to all delegations on the first day of the session, in case there are minor amendments to be made to the title, agenda item or presenter of the presentations listed, and that list should be closed by the adjournment of the last plenary meeting of that day. The Secretariat should not allow additional requests for presentations after that day.

276. The Subcommittee recommended that the same criteria should apply, as appropriate, to the organization of work of the Committee, which regularly also had a high number of scientific and technical presentations.

277. The Subcommittee requested the Secretariat to report to the Committee at its fifty-eighth session on the modalities of organizing the time of plenary meetings in order to allow working groups to meet before the delivery of scientific and technical presentations, and to report on any available technical means of assisting delegations in keeping track of the timing of statements and presentations.

278. The Subcommittee requested the Secretariat to make available for the sessions of the Committee and its Subcommittees in 2016 a compendium containing the rules, procedures and practices, including the processing of documentation, of the Committee and its subsidiary bodies.

279. Some delegations expressed the view that the scheduling of scientific and technical presentations outside plenary meetings should be considered.

280. The view was expressed that multiple statements should not be delivered by the same delegation under the same agenda item.

281. Some delegations expressed the view that while general statements could be limited to one statement per delegation, delegations had the right to make as many interventions under any agenda item, as necessary.

282. The view was expressed that consideration of legal aspects of space activities should be undertaken during the sessions of the Legal Subcommittee, in order to allow enough time for consideration of technical aspects by the Scientific and Technical Subcommittee.

Annex I

Report of the Working Group of the Whole

1. In accordance with paragraph 8 of General Assembly resolution 69/85, the Scientific and Technical Subcommittee, at its fifty-second session, reconvened its Working Group of the Whole. From 6 to 12 February 2015, the Working Group held three meetings, under the chairmanship of V. K. Dadhwal (India). The Working Group considered the item on space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda, and the draft provisional agenda for the fifty-third session of the Subcommittee, to be held in 2016. At its third meeting, on 12 February, the Working Group adopted the present report.

I. Space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda

2. For its consideration of the item on space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda, the Working Group had before it the documents referred to under item 5 of the agenda of the Subcommittee (see para. 56 in the main body of the report, above).

3. The Working Group considered the conference room paper entitled "Revised draft proposed workplan for a mechanism of cooperative deliberation for space and sustainable development: bridging the Committee on the Peaceful Uses of Outer Space and the Scientific and Technical Subcommittee" (A/AC.105/C.1/2015/CRP.15) and the note by the past, present and incoming chairs of the Committee on the Peaceful Uses of Outer Space entitled "2018 'UNISPACE+50' theme of the Scientific and Technical Subcommittee, the Legal Subcommittee and the Committee on the Peaceful Uses of Outer Space" (A/AC.105/C.1/2015/CRP.30).

4. The Working Group agreed to the main proposal by the past, present and incoming chairs of the Committee (A/AC.105/C.1/2015/CRP.30), and requested the Secretariat, in close consultation with the past, present and incoming chairs of the Committee, to develop their proposal in further detail and present it in the six official languages of the United Nations for consideration by the Committee at its fifty-eighth session in June 2015, taking into account the following:

(a) The objective and main approach contained in conference room paper A/AC.105/C.1/2015/CRP.15 should be consolidated with the preparatory work to be undertaken prior to the 2018 "UNISPACE+50" thematic cycle of the Committee;

(b) The preparatory work for 2018 could benefit from the work of the expert group on space and global health and the proposed new thematic priority for the United Nations Programme on Space Applications: space technologies for monitoring and protecting biodiversity and ecosystems (A/AC.105/C.1/2015/CRP.31);

(c) The following cross-cutting topics could be considered in presenting the unique role of the Committee, its subsidiary bodies and the Office for Outer Space Affairs: (a) governance, including the United Nations treaties and principles on outer space, guidelines adopted by the Committee and General Assembly resolutions on outer space; (b) capacity-building, including activities of member States of the Committee and permanent observers to the Committee, and work undertaken by the Office for Outer Space Affairs and the regional centres on space science and technology education, affiliated to the United Nations; (c) resiliency, including matters related to the ability to depend on space systems and to respond to the impact of events such as adverse space weather; (d) interoperability, including work done by the International Committee on GNSS and other coordination mechanisms; and (e) space for sustainable development, including consideration of the contribution of the Committee to the United Nations Conference on Sustainable Development (A/AC.105/993) and efforts by the Committee and its member States to meet global development goals.

5. The Working Group noted that the expert group on space and global health, established by the Committee on the Peaceful Uses of Outer Space at its fifty-seventh session in 2014, had held its first meeting on 5 February 2015 on the margins of the present session of the Subcommittee.

6. The expert group on space and global health presented, under the leadership of Canada, its method and programme of work, including a concrete timeline, to the Working Group for its consideration at the fifty-second session of the Subcommittee (A/AC.105/C.1/2015/CRP.29).

7. At its second meeting, on 10 February 2015, the Working Group agreed on the mandate and workplan of the expert group, which read as follows:

(a) Mandate:

1. The expert group reviews and analyses current uses of space (technology, applications, practices and initiatives) in support of global health needs in order to identify gaps, propose recommendations and provide orientation for the future work of the Subcommittee.

2. By holding work sessions on the margins of the sessions of the Subcommittee, the expert group provides a forum to enable Member States, international intergovernmental organizations, non-governmental organizations and their respective experts to share needs, opportunities, best practices and expertise to actively engage, link and enable use of space (technology, applications, practices, capacity-building and initiatives) for global health purposes.

3. By reporting to the Subcommittee through its Working Group of the Whole, the expert group increases awareness, engagement and promotion of collaborative and direct actions by Member States on this topic while concentrating their energy on achieving tangible and long-lasting results.

(b) Workplan: the activities of the expert group are planned over the next three years. The workplan of the expert group includes:

1. Review of the current and evolving state of affairs relative to the use of space (technology, applications, practices and initiatives) in support of global health needs and the specific scope of the expert group (2015).

2. Compile practices and initiatives, current or planned (concepts, science, capacity-building, operations) according to the proposed scope (mainly 2015-2016).

3. Analyse gaps and opportunities for future development and to enhance alignment with global health goals according to the current context (mainly 2016-2017).

4. Explore possible cooperative and user-driven solutions to address these gaps (mainly 2017-2018).

5. Continue efforts to promote the active engagement of the Committee on the Peaceful Uses of Outer Space and other relevant national and international organizations in tangible actions in this domain (ongoing).

II. Draft provisional agenda for the fifty-third session of the Scientific and Technical Subcommittee

8. The Working Group of the Whole noted that, in accordance with General Assembly resolution 69/85, the Scientific and Technical Subcommittee would submit to the Committee its proposal for the draft provisional agenda for the fifty-third session of the Subcommittee, to be held in 2016, and agreed that the topic for the 2016 symposium to be organized by the Office for Outer Space Affairs, in accordance with the agreement reached by the Subcommittee at its forty-fourth session, in 2007 (A/AC.105/890, annex I, para. 24), should be "The role of industry in space exploration".

Annex II

Report of the Working Group on the Use of Nuclear Power Sources in Outer Space

1. At its 815th meeting, on 2 February 2015, the Scientific and Technical Subcommittee reconvened its Working Group on the Use of Nuclear Power Sources in Outer Space, under the chairmanship of Sam A. Harbison (United Kingdom of Great Britain and Northern Ireland).

2. The Working Group recalled the objectives of its multi-year workplan for the period 2010-2015, adopted by the Subcommittee at its forty-seventh session, in 2010 (A/AC.105/958, annex II, para. 7) and extended to 2017 by the Subcommittee at its fifty-first session, in 2014 (A/AC.105/1065, annex II, para. 9):

(a) To promote and facilitate the implementation of the Safety Framework for Nuclear Power Source Applications in Outer Space by providing information pertinent to challenges faced by member States and international intergovernmental organizations, in particular those considering or initiating involvement in applications of nuclear power sources (NPS) in outer space;

(b) To identify any technical topics for, and establish the objectives, scope and attributes of, any potential additional work by the Working Group to further enhance safety in the development and use of space NPS applications. Any such additional work would require the approval of the Subcommittee and would be developed with due consideration for relevant principles and treaties.

3. The Working Group noted and discussed the following papers and presentations, which were before the Subcommittee:

(a) Paper submitted by the United Kingdom entitled "A trial set of safety recommendations to implement the guidance for governments section of the Safety Framework" (A/AC.105/C.1/L.342 and A/AC.105/C.1/2015/CRP.3);

(b) Presentation by the United Kingdom entitled "Space nuclear power systems: update on activities and programmes in the United Kingdom" (A/AC.105/C.1/2015/CRP.5);

(c) Presentation by China entitled "The progress of the Chinese Lunar Exploration Program".

4. The Working Group, at its informal meetings, had further discussion of the presentations referred to in paragraph 3 above, including a discussion of the safety management of Chang'e-3 of China, which was successfully launched on 2 December 2013, and which used radioisotope heater units for maintaining the temperature during the lunar night.

5. The Working Group discussed the following potential activities to further enhance safety in the development and use of space NPS applications:

(a) Conduct a survey among member States concerning the implementation of the Safety Framework;

(b) Prepare a technical document, by one or more member States with experience in space NPS applications, and potentially in cooperation with the International Atomic Energy Agency, focused on the practical achievement of safety in space NPS applications;

(c) Receive presentations from member States with experience in space NPS applications on their mission-specific experiences in implementing the guidance contained in the Safety Framework and in satisfying the intent of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space.

6. The Working Group agreed to hold an intersessional teleconference in June 2015, in order to gather additional information to further the development of the potential activities referred to in paragraph 5 above and to facilitate the preparation of its draft report during the fifty-third session of the Subcommittee.

7. Some delegations were of the view that it was important for the Working Group to conduct its work on furthering the safety of space NPS bearing in mind the importance of States' supervision and registration of their national space activities, the importance of the long-term sustainability of outer space activities and the need to protect human life and environment. The delegations expressing that view were also of the view that legal aspects of the use of NPS in outer space should be considered in close cooperation between the Scientific and Technical and Legal Subcommittees.

8. Some delegations were of the view that it continued to be important for the Working Group to complete its work on facilitating the implementation of the Safety Framework, in accordance with the objectives of its workplan referred to in paragraph 2 above, before considering any potential expansion of work into areas covered under other agenda items of the Committee and its Subcommittees.

9. Some delegations were of the view that the objectives of the Working Group's multi-year workplan should be in conformity with international law, the Charter of the United Nations and the United Nations treaties and principles on outer space, in particular the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.

10. The view was expressed that all member States should be involved in the decision-making and in identifying the issues and challenges associated with the application of NPS and the Safety Framework and that that would ensure the success of the implementation of the workplan. The delegation expressing that view was also of the view that all decisions of the Working Group should be subject to a strict agreement of the Subcommittee.

11. The Chairman of the Working Group expressed the view that care had been taken to follow the multi-year workplan and ensure transparency in all the deliberations of the Working Group, recalling that invitations had been extended to all member States and permanent observers to attend the informal deliberations of the Working Group.

12. The Working Group took note of the web page maintained by the Secretariat containing the technical papers and presentations, in all official languages of the United Nations, that had been provided to the Working

Group since the Safety Framework was adopted by the Committee (see www.unoosa.org/oosa/en/COPUOS/stsc/wgnps/index.html).

13. At its 4th meeting, on 12 February 2015, the Working Group adopted the present report.

Annex III

Report of the Working Group on the Long-term Sustainability of Outer Space Activities

1. In accordance with paragraph 8 of General Assembly resolution 69/85, the Scientific and Technical Subcommittee, at is fifty-second session, reconvened its Working Group on the Long-term Sustainability of Outer Space Activities.

2. The Working Group held meetings from 3 to 13 February 2015, under the chairmanship of Peter Martinez (South Africa).

3. In accordance with the workplan extended by the Committee at its fifty-seventh session (A/69/20, para. 199), the Working Group had before it the following:

(a) Note by the Secretariat containing an updated set of draft guidelines for the long-term sustainability of outer space activities (A/AC.105/C.1/L.340);

(b) Working paper by the Chair of the Working Group containing a draft report of the Working Group on the Long-term Sustainability of Outer Space Activities (A/AC.105/C.1/L.343);

(c) Conference room paper containing a proposal by the United States of America for an additional guideline (A/AC.105/C.1/2015/CRP.10);

(d) Conference room paper containing comments and proposed amendments by Germany on the updated set of draft guidelines (A/AC.105/C.1/2015/CRP.11);

(e) Conference room paper containing a proposal by Belgium for additional text to be inserted in the updated set of draft guidelines (A/AC.105/C.1/2015/CRP.12);

(f) Conference room paper submitted by Brazil containing a proposal for an additional guideline as well as comments and proposed amendments to the updated set of draft guidelines for the long-term sustainability of outer space activities (A/AC.105/C.1/2015/CRP.19);

(g) Conference room paper submitted by the Group of Latin American and Caribbean States containing a proposal for an additional guideline as well as comments and proposed amendments to the updated set of draft guidelines for the long-term sustainability of outer space activities (A/AC.105/C.1/2015/CRP.19/Rev.1);

(h) Working paper submitted by the Russian Federation entitled "Achievement of a uniform interpretation of the right of self-defence in conformity with the United Nations Charter as applied to outer space as a factor in maintaining outer space a safe and conflict-free environment and promoting the long-term sustainability of outer space activities" (A/AC.105/C.1/2015/CRP.22, to be reissued as a formal document of the fifty-eighth session of the Committee on the Peaceful Uses of Outer Space, in the six official languages of the United Nations), containing a proposal for an additional guideline on "Implementation of operational and technological self-restraints to forestall adverse developments in outer space";

(i) Working paper submitted by the Russian Federation entitled "Considerations regarding the modalities of consolidating the understanding on issues pertaining to the enhancement of the practice in registering space objects in view of the necessity of ensuring the safety of space operations" (A/AC.105/C.1/2015/CRP.23, to be reissued as a formal document of the fifty-eighth session of the Committee on the Peaceful Uses of Outer Space, in the six official languages of the United Nations), containing a proposal for an additional guideline on the subject matter;

(j) Working paper submitted by the Russian Federation entitled "Additional considerations and proposals aimed at building up understanding of the priority aspects, comprehensive meaning and the functions of the concept and practices of ensuring the long-term sustainability of outer space activities" (A/AC.105/C.1/2015/CRP.24, to be reissued as a formal document of the fifty-eighth session of the Committee on the Peaceful Uses of Outer Space, in the six official languages of the United Nations), containing proposals for six additional guidelines on various aspects of the subject matter;

(k) Conference room paper submitted by the Islamic Republic of Iran containing a proposed amendment for the proposal for the consolidation of the set of draft guidelines on the long-term sustainability of outer space activities (A/AC.105/C.1/2015/CRP.25);

(l) Conference room paper submitted by France containing comments and proposed amendments to the updated set of draft guidelines (A/AC.105/C.1/2015/CRP.28);

(m) Working paper submitted by the Russian Federation entitled "Proposal on the review and consideration of the concept of a United Nations information platform serving common needs in collecting and sharing information on near-Earth space monitoring in the interests of safety and security of space operations, and its architectural and programmatic aspects" (A/AC.105/C.1/2015/CRP.32, to be reissued as a formal document of the fifty-eighth session of the Committee on the Peaceful Uses of Outer Space, in the six official languages of the United Nations).

4. The Subcommittee also had before it the following:

(a) Note by the Secretariat entitled "Recommendations of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities: views of States members of the Committee on the Peaceful Uses of Outer Space" (A/AC.105/1080);

(b) Submission by the Russian Federation entitled "Identification of cross-linkages between the recommendations contained in the Report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities and the topic of developing the guidelines on the long-term sustainability of outer space activities" (A/AC.105/C.1/2015/CRP.33, to be reissued as an addendum to A/AC.105/1080).

5. At the meeting of the Working Group on 3 February, the Chair of the Working Group presented a review of the progress made since the fifty-first session of the Subcommittee, in February 2014, and an outline of the work to be accomplished by the Working Group during the current session.

6. The Working Group noted that at its fifty-seventh session, in 2014, the Committee had agreed on an extension of the workplan for the Working Group (A/69/20, para. 199). The Working Group also noted that it had not affirmed during the present session that it could fully proceed with its workplan, that no revision of the workplan had been discussed during the present session, and that it would consider the matter at the fifty-eighth session of the Committee, in June 2015.

7. The Working Group noted that the finalization of the expert group reports in 2014 had marked the transfer of the discussion of the guidelines from the expert groups to the Working Group.

8. The Working Group noted that, in addition to the Working Group meetings scheduled for the present session of the Subcommittee, the Chair would also hold informal consultations with interested delegations, and that the Chair and the translation and terminology reference group would continue to consider questions specific to translation and the use of terminology as the set of draft guidelines was further developed.

9. At the meeting of the Working Group on 5 February, the Chair of the Working Group presented a summary of the informal consultations held on 4 and 5 February 2015, where interested delegations discussed proposals for additional guidelines and for restructuring the set of draft guidelines.

10. At the meeting of the Working Group on 6 February, the Chair of the Working Group invited delegations proposing additional guidelines to introduce their proposals. Proposals contained in conference room papers A/AC.105/C.1/2015/CRP.10, A/AC.105/C.1/2015/CRP.19, A/AC.105/C.1/2015/CRP.22, A/AC.105/C.1/2015/CRP.23 and A/AC.105/C.1/2015/CRP.24 were presented by the respective delegations and an exchange of views took place.

11. On the basis of a proposal presented under agenda item 13 of the Subcommittee on 3 February, and later incorporated into conference room paper A/AC.105/C.1/2015/CRP.28, some delegations expressed support for a restructuring of the guidelines as they were issued in informal consultations.

12. At its meeting on 9 February, the Working Group commenced the consideration of the updated set of draft guidelines (A/AC.105/C.1/L.340).

13. At the meeting of the Working Group on 10 February, the Chair of the Working Group presented a summary of the informal consultations held on 9 and 10 February, and the Working Group continued its exchange of views on the updated set of draft guidelines (A/AC.105/C.1/L.340).

14. At the meeting of the Working Group on 11 February, the Chair of the Working Group presented a summary of the informal consultations held earlier that day, and the Working Group noted that an updated version of the set of draft guidelines would be prepared in the six official languages of the United Nations prior to the fifty-eighth session of the Committee in 2015. The Working Group noted that 1 April 2015 was the deadline for submitting clarifying information on proposed amendments and restructuring of the draft guidelines contained in document A/AC.105/C.1/L.340 and additional draft guidelines proposed at the fifty-second session of the Subcommittee.

15. The Working Group noted that the fifty-eighth session of the Committee, in 2015, would mark the deadline for proposing additional guidelines or significant new elements to existing guidelines. The Working Group also noted that contributions not referred to in paragraph 14 above, received before 1 April 2015, would be made available in the six official languages of the United Nations for the fifty-eighth session of the Committee.

16. The Working Group noted that the Chair of the Working Group would consult with the Chair of the Committee and with the Secretariat regarding the scheduling of the fifty-eighth session of the Committee so as to enable the Working Group to meet during the session and benefit from the interpretation services.

17. The Working Group noted that its work during the current session of the Subcommittee had been affected by a lack of time.

18. On 12 February, the Working Group considered its draft report.

19. On 13 February, the Working Group considered and adopted the present report.

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Committee on the Peaceful Uses of Outer Space

Report on the United Nations/China/Asia-Pacific Space Cooperation Organization Workshop on Space Law on the Role of National Space Legislation in Strengthening the Rule of Law

(Beijing, 17 to 20 November 2014)

I. Introduction

A. Background and objectives

1. International and regional cooperation in the peaceful uses of outer space helps to bring the benefits of space technology applications to a wide circle of stakeholders, both governmental and non-governmental, and to intensify and diversify national space programmes. Policy and regulatory frameworks at the national, regional and international levels are of paramount importance for providing the necessary basis for States, particularly developing countries, to meet development goals and address challenges to sustainable development. In this connection, it is necessary to continue to strengthen the linkages between international space law and the conduct of space activities.

2. Each year, the General Assembly, in its resolution on international cooperation in the peaceful uses of outer space, reaffirms the importance of international cooperation in developing the rule of law, including the relevant norms of space law, and urges States that have not yet become parties to the international treaties governing the uses of outer space to give consideration to ratifying or acceding to them, as well as incorporating them into their national legislation. National space laws and other regulatory frameworks are necessary for States to implement their obligations under the United Nations treaties and to meet their specific national requirements.

3. Given the growing number of benefits derived from space science and technology applications, space activities by States, intergovernmental and

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non-governmental entities, and the private sector continue to expand. In developing international and regional space cooperation, States should ensure that all actors conducting space activities comply with the requirements of international space law and that this branch of public international law properly reflects the needs of contemporary space activities.

4. The successful implementation and application of the international legal framework governing space activities depend on the understanding and acceptance, by policymakers and decision makers, of the legal framework governing the conduct of space activities. The presence of suitable professionals, particularly in developing countries, who are able to provide legal advice and disseminate information and knowledge relating to space law is therefore dependent on adequate opportunities for education in space law and policy.

5. In order to promote adherence to the five United Nations treaties on outer space and to assist States in building their capacity in space law, the United Nations, together with the Government of China, the Asia-Pacific Space Cooperation Organization (APSCO) and the China National Space Administration (CNSA), organized the Workshop on Space Law on the Role of National Space Legislation in Strengthening the Rule of Law, hosted by CNSA and held in Beijing from 17 to 20 November 2014.

6. The Workshop, among other things, addressed the rule of law and global governance of space activities; the development of space policy, transparency and confidence-building measures in outer space activities; perspectives on space-traffic management; space law and commercial space activities, including the operation of small and very small satellites; and national space legislation of both major spacefaring nations and emerging space nations. The Workshop also addressed mechanisms for regional and interregional cooperation, including intergovernmental organizations such as the European Space Agency (ESA) and APSCO, and the intergovernmental processes of the International Committee on Global Navigation Satellite Systems (ICG) and the International Space Exploration Forum (ISEF). The role of bilateral and multilateral agreements in joint space ventures was discussed. Capacity-building in and the teaching of space law were considered.

7. The Workshop welcomed the newly established Regional Centre for Space Science and Technology Education in Asia and the Pacific, affiliated to the United Nations, which is hosted by Beihang University in Beijing. The United Nations curriculum on space law was also examined. The Workshop concluded with a session dedicated to regulatory and institutional aspects of the use of space-derived data and information, with an emphasis on remote sensing and global navigation satellite systems (GNSS). The Beijing office of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) was involved in the planning and completion of that dedicated session, specifically, in order to provide a link between scientific, technical, administrative, institutional, legal and policy considerations.

8. The main objectives of the Workshop were:

(a) To promote understanding, acceptance and implementation of the United Nations treaties and principles on outer space;

(b) To promote exchange of information on national space legislation and policies for the benefit of professionals involved in national space activities;

(c) To consider the contribution of space law to economic and social development, and the use of space-derived geospatial data for sustainable development;

(d) To consider trends in and challenges to international space law;

(e) To consider mechanisms for increasing regional cooperation in the peaceful uses of outer space;

(f) To consider the development of university-level studies and programmes in space law, with a view to promoting national expertise and capacity in this field.

9. The Workshop was the ninth in a series of workshops organized by the Office for Outer Space Affairs of the Secretariat to build capacity in space law.

10. The present report was prepared for submission to the Committee on the Peaceful Uses of Outer Space at its fifty-eighth session and to its Legal Subcommittee at its fifty-fourth session, both to be held in 2015.

B. Attendance

11. The Workshop was attended by 133 people: legislators, Government officials, practitioners and educators holding positions in Government departments; representatives of space agencies, international organizations, national universities, research institutions and the private sector; and university students.

12. Invited speakers and participants from the following countries and from academic institutions in those countries contributed to the Workshop: Afghanistan, Argentina, Armenia, Australia, Austria, Azerbaijan, Bangladesh, Canada, China, Ethiopia, France, Germany, Indonesia, Iran (Islamic Republic of), Italy, Japan, Lao People's Democratic Republic, Mexico, Mongolia, Netherlands, Pakistan, Peru, Republic of Korea, Russian Federation, Sri Lanka, Thailand, Turkey, United Arab Emirates, United States of America and Venezuela (Bolivarian Republic of). Officials from the United Nations Institute for Disarmament Research and the Office for Outer Space Affairs also contributed to the Workshop.

13. Funds provided by the United Nations, the Government of China, CNSA and APSCO were used to cover the travel and living costs of 30 participants from the Asia-Pacific region selected on the basis of their experience and potential to influence the development of space law and policy, build capacity and promote education in space law in their countries.

C. Programme

14. The Administrator of CNSA, the Director of the Office for Outer Space Affairs, the Secretary-General of APSCO and an official of the National People's Congress of China opened the Workshop with introductory and welcoming statements. Two dedicated keynote addresses were given, on the concept of the rule

of law in outer space activities, and on the development of international space law: legal framework, objective and orientation.

15. The first session of the Workshop focused on developments in space law and policy. Presentations on the following topics were given:

(a) Space law treaties and "soft law" development;

(b) Development of space policy and its role;

(c) Role of transparency and confidence-building in promoting the rule of law in outer space activities;

(d) Perspectives on space-traffic management.

16. The second session was dedicated to space law and commercial space activities. Presentations on the following topics were given:

(a) Legal aspects of commercial space activities;

(b) Operation of small and very small satellites: the case of authorization, supervision and control, and registration;

(c) Legal issues related to satellite launch: perspectives of China.

17. The third session, on experiences and prospects in promoting national space legislation, focused on national legal frameworks governing space activities. The session comprised presentations and two panel discussions in which participants considered how national space laws and policies were developed. Presentations on the following general topics were given:

(a) General Assembly resolution 68/74, on recommendations on national legislation relevant to the peaceful exploration and use of outer space;

(b) Responsibility and liability for national space activities;

(c) Registration of space objects with the United Nations.

18. In that session, presentations were made on the national regulatory frameworks of Australia, China, Japan, the Russian Federation, the United States and of the States members of the European Union and ESA. The panel discussion on exchange of information on national regulatory frameworks comprised the following countries: Azerbaijan, Indonesia, Iran (Islamic Republic of), Pakistan, Republic of Korea and Thailand.

19. The fourth session focused on mechanisms for regional and international cooperation. Presentations were made on the following topics:

(a) International cooperation mechanisms on space activities: perspectives on the Working Group on the Review of International Mechanisms for Cooperation in the Peaceful Exploration and Use of Outer Space of the Legal Subcommittee;

(b) Role of APSCO and its legal structure;

(c) Role of bilateral and multilateral agreements in international space cooperation;

(d) The example of ESA;

(e) ICG and ISEF as mechanisms for cooperation.

20. The fifth session was dedicated to capacity-building in space law and education. The session comprised presentations on the following topics:

(a) Role of capacity-building in space law development at the national level from the perspective of China;

(b) United Nations curriculum on space law;

(c) Teaching of space law at regional centres for space science and technology education, affiliated to the United Nations: the case of the Beihang regional centre.

21. The session ended with a round-table discussion on ways and means of promoting education in space law, with participants from a number of universities, academic institutions and research institutes in the following countries: Australia, Austria, Canada, China, France, Japan, Republic of Korea and United States.

22. During the sixth session, regulatory and institutional aspects concerning the use of space-derived data and information were explored. Presentations on the following topics were delivered:

(a) Policies and practices relating to the use of space-based information for development and disaster management;

(b) International regulatory perspectives on Earth observation data: China's practice;

(c) Regulatory aspects concerning Earth observation: a brief survey of remote sensing law and policy around the world;

(d) Regulatory aspects of GNSS;

(e) Use of satellite data in international litigation: new developments and applications.

23. The papers presented at the Workshop are available on the website of the Office for Outer Space Affairs (www.unoosa.org) and will be published as proceedings of the United Nations/China/APSCO Workshop on Space Law (ST/SPACE/66).

II. Recommendations, observations and conclusions

24. The Workshop centred its discussion on the role of national space legislation in strengthening the rule of law to adequately address the complexity of regulatory mechanisms and policy development in space activities.

25. The Workshop structured its substantive work in closely interrelated sessions, looking first into developments in space law and policy, including discussions on space law treaties and the evolution of space law. This provided a sound basis for reviewing the legal aspects of commercial space activities and studying national space regulatory frameworks. The Workshop also considered various mechanisms for regional and international cooperation in space activities and, in particular, the role of bilateral and multilateral agreements. The Workshop further considered national and international capacity-building efforts addressing space law and policy.

26. In view of the important role played by space science and technology applications in meeting the global development goals, the Workshop assessed the regulatory and institutional aspects relating to the use of space-derived data and information for sustainable development, with particular emphasis on Earth observation and GNSS.

27. The Workshop made general observations on the concept of the rule of law in outer space activities and conducted a review of the objectives of international space law development. In that connection, the Workshop noted that, in view of the growing number of benefits derived from space science and technology applications, the conduct of space activities by States, intergovernmental and non-governmental entities, and the commercial and private sector, continued to expand rapidly and therefore needed attention from a national regulatory and policy development perspective.

28. The Workshop took note of General Assembly resolution 60/1, on the 2005 World Summit Outcome, in which the Assembly acknowledged that good governance and the rule of law at the national and international levels were essential for sustained economic growth, sustainable development and the eradication of poverty and hunger.

29. The Workshop acknowledged, in that context, that the General Assembly, in its annual resolution on international cooperation in the peaceful uses of outer space, reaffirmed the importance of international cooperation in developing the rule of law, including the relevant norms of space law, and urged States that had not yet become parties to the international treaties governing the uses of outer space to give consideration to ratifying or acceding to them, as well as incorporating them into their national legislation.

30. The Workshop assessed that space tools were increasingly fundamental for meeting the challenges to humanity and sustainable development, and that the overarching space security environment in its broader sense catered for global space governance. In that context, the successful implementation and application of the international legal regime governing the conduct of space activities therefore depended on the common understanding and acceptance by policymakers and decision makers of that legal framework.

31. In addressing those overarching perspectives, the Workshop explored legal and policy mechanisms, such as transparency and confidence-building measures and space traffic management tools, in order to build an understanding of various processes relevant to space policy development at the national and international levels. The Workshop assessed mechanisms used by States in implementing their rights and obligations under the United Nations treaties on outer space, as well as in their application of "soft law" instruments, such as principles, declarations, resolutions and other guidelines on space activities.

32. The Workshop noted that, with the evolution of space awareness in society, the Committee on the Peaceful Uses of Outer Space and its subsidiary bodies had evolved as a unique common platform for strengthening the capacity of countries, in particular developing countries, in the use and application of space science and technology for sustainable development and in efforts to enhance the long-term sustainability of outer space activities for peaceful purposes.

33. The Workshop considered the importance of taking into account the special needs of the disadvantaged communities of the world to build their capacities in an expedient manner to enable them to fully exploit the benefits of space-based technology applications for their sustainable development needs.

34. The Workshop observed that the Committee had, in line with General Assembly resolution 68/50, on transparency and confidence-building measures in outer space activities, agreed on the importance of considering the broader perspective of space security and associated matters that would be instrumental in ensuring the safe and responsible conduct of space activities. The Workshop expressed appreciation for the decision of the Committee to consider at its session in 2015 the recommendations of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities (A/68/189) as they related to the safety of space operations and the long-term sustainability of outer space activities.

35. The Workshop recognized that outer space was a fragile environment where the steps taken by one actor might have an impact on others, including users of space services on Earth. In that sense, the broader application of space operations and the increased strategic value of space had resulted in a growing need to enhance the safety of space operations, the security of the space environment and space assets, and the long-term sustainability of outer space activities.

36. The Workshop assessed that, against the complex nature of space activities, with many actors at different levels and amid rapid technical developments, such as in space transportation and small and very small satellites, there was a need for consistency, predictability and stability in national legal frameworks governing space activities for the benefit of all actors.

37. The Workshop welcomed General Assembly resolution 68/74, on recommendations on national legislation relevant to the peaceful exploration and use of outer space, which provided a set of elements for consideration, as appropriate, by States when enacting regulatory frameworks for national space activities, in accordance with their national legal systems.

38. The Workshop conducted an overview of national policy and regulatory frameworks, legislative development and institutional mechanisms for space activities of a broad range of countries with different levels of national space activities. The Workshop noted that different approaches were taken by States to meeting their specific needs and practical considerations.

39. The Workshop observed that many national regulatory frameworks covered the main elements under General Assembly resolution 68/74. Those elements included the scope of space activities targeted by regulatory frameworks; national jurisdiction for regulating the space activities of governmental and non-governmental entities; procedures for the authorization and licensing of national space activities, including to ensure continuing supervision and monitoring of authorized space activities; registration of objects launched into outer space and establishment of national registries; liability and indemnification procedures; and procedures with regard to the change in status of the operation of a space object in orbit. The Workshop agreed that action could be taken by other States to cover those elements when developing national regulatory frameworks.

40. The Workshop examined the role of international intergovernmental organizations for space cooperation, such as ESA and APSCO, and other mechanisms of an intergovernmental nature, such as ICG and ISEF. The Workshop noted the high degree of international cooperation in space activities at the regional, interregional and international levels, and the increasing number of public-private partnerships between governmental and non-governmental entities in all areas of the space sector. International mechanisms for cooperation in space activities, such as bilateral and multilateral agreements, played an important role in identifying the legal grounds for space ventures, and could be of fundamental importance in the application and implementation of the international legal regime governing space activities.

41. In recognizing the increasing dependence on space science and technology applications in efforts to meet global development goals and targets, including within the context of the post-2015 development agenda process, the Workshop noted the importance of building spatial data infrastructure at the national and regional levels in order to enhance the capacity to access and use space-derived data and information for sustainable development. The establishment and strengthening of national spatial data policies, regulatory frameworks and infrastructure was crucial for the timely acquisition, effective utilization and proper sharing of satellite data, in particular to build resilience to mitigate the consequences of disasters.

42. The Workshop reiterated that capacity-building, training and education in space law were of paramount importance to further develop the practical aspects of space science and technology and to increase knowledge of the legal framework within which space activities were carried out. It was particularly important to bring together different space communities, as well as students and professionals, and enhance cross-sectoral dialogue, at both the academic and the practical level, including through innovative Internet-based educational tools.

43. The United Nations curriculum on space law was regarded as an important effort to further encourage space law studies at the regional centres for space science and technology education, affiliated to the United Nations and in universities and other academic and research institutions. The Workshop observed the importance of closer cooperation and dialogue between universities and institutions with established space law programmes and those educational institutions wishing to develop such programmes, as such cooperation could assist in overcoming the hurdles of limited access to materials and related costs, as well as language barriers.

44. The Workshop acknowledged the contribution by APSCO to capacity-building in space science and technology, as well as law and policy. The Workshop particularly welcomed the establishment of the Regional Centre for Space Science and Technology Education in Asia and the Pacific, affiliated to the United Nations, and based at Beihang University in Beijing, and noted with satisfaction the structuring of its academic programme to include space law training.

45. The Workshop expressed its deep appreciation to the Office for Outer Space Affairs and its UN-SPIDER office in Beijing, the Government of China, APSCO, and CNSA for the organization of the Workshop and for the excellent hospitality and conference facilities provided by CNSA.